



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

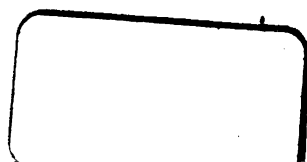
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

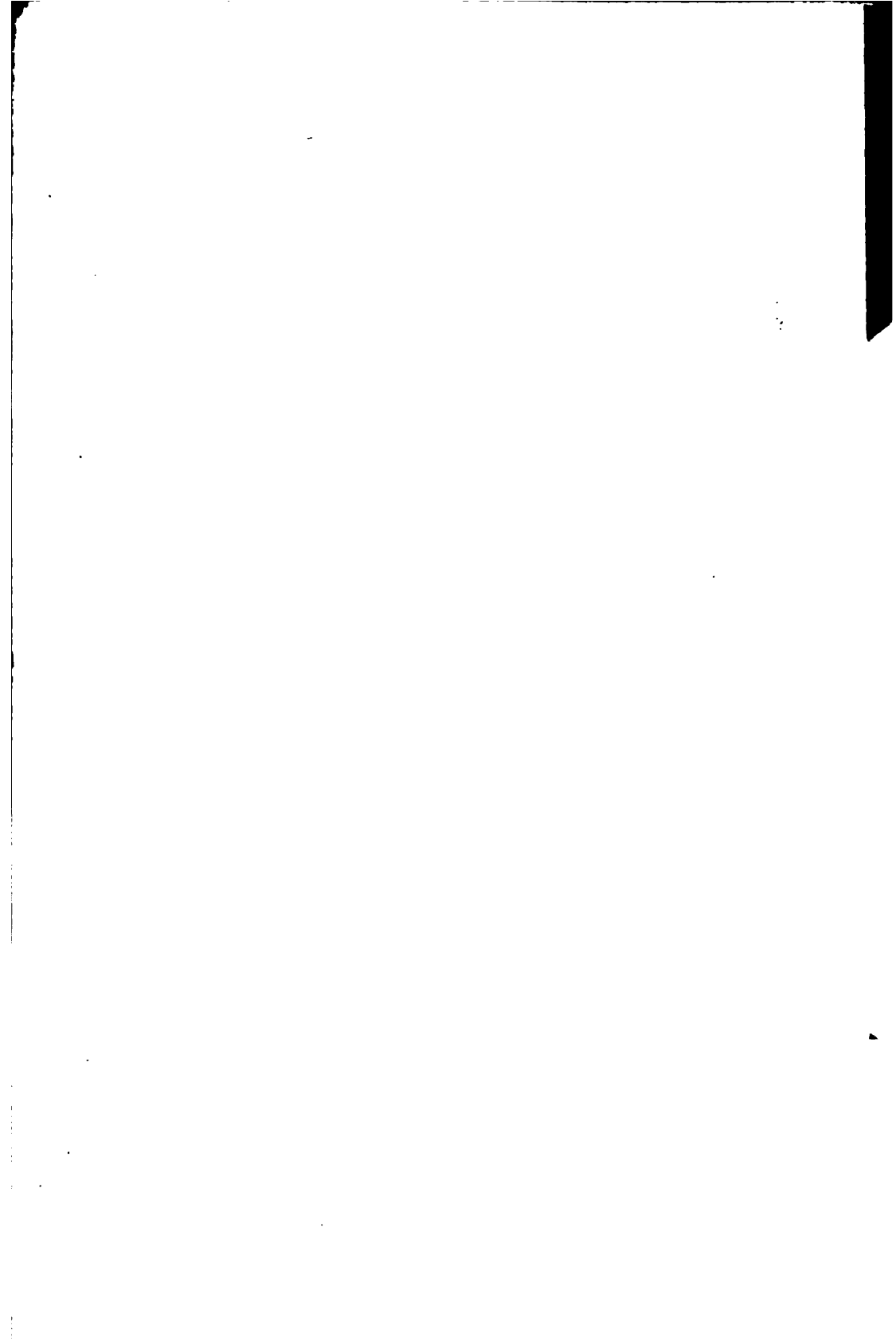
We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>













**JOURNAL**  
**OF THE ASSOCIATION OF**  
**MILITARY**  
**SURGEONS**  
**OF THE UNITED STATES.**

EDITED BY

**JAMES EVELYN PILCHER, M.D., L.H.D.**  
MAJOR AND BRIGADE SURGEON OF UNITED STATES VOLUNTEERS;  
CAPTAIN, RETIRED, IN THE UNITED STATES ARMY.

---

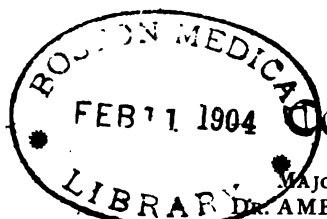
**VOLUME XIII.**

---



CARLISLE, PENNSYLVANIA,  
THE ASSOCIATION OF MILITARY SURGEONS.

1903



## Contributors.

MAJOR AZEL AMES, U.S.V.  
DR. AMERICUS REEVES ALLEN.  
LIEUTENANT CHARLES NORTON BARNEY, U.S. ARMY.  
HONORABLE JOHN L. BATES, GOVERNOR OF MASSACHUSETTS.  
SURGEON HENRY GUSTAV BEYER, U.S. NAVY.  
BRIGADIER GENERAL ROBERT ALLEN BLOOD, M.V.M.  
MAJOR WILLIAM CLINE BORDEN, U.S. ARMY.  
BRIGADIER GENERAL EDMUND CONE BRUSH, O.N.G.  
LIEUTENANT JAMES CARROLL, U.S. ARMY.  
SURGEON GENERAL WILLIAM J. CHARLTON, A.M.S. ENGLAND.  
MAJOR THOMAS CHALMERS CLARK, MINN. N.G.  
LIEUTENANT CHARLES FRANKLIN CRAIG, U.S. ARMY.  
KAPTEIN HANS DAAE, NORWEGIAN ARMY.  
SURGEON SHELDON GUTHRIE EVANS, U.S. NAVY.  
CAPTAIN CHARLES EDWARD BELIN FLAGG, U.S. ARMY.  
LIEUTENANT COLONEL CHARLES CHAUNCEY FOSTER, M.V.M.  
DR. GEORGE E. FRANCIS OF MASSACHUSETTS.  
COLONEL WILLIAM CRAWFORD GORGAS, U.S. ARMY.  
BRIGADIER GENERAL JEFFERSON DAVIS GRIFFITH, N.G. Mo  
SURGEON JOSEPH ALFRED GUTHRIE, U.S. NAVY.  
LIEUTENANT COLONEL HAROLD GEORGE HATHWAY, R.A.M.C.  
CONTRACT SURGEON MELVILLE AMBROSE HAYS, U.S. ARMY.  
LIEUTENANT COLONEL WILLIAM HILL-CLIMO, A.M.S., ENGLAND.  
LIEUTENANT COLONEL JOHN VAN RENSSELAER HOFF, U.S. ARMY.  
MAJOR FRANCIS JOSEPH IVES, U.S. ARMY.  
BREVET MAJOR ARTHUR R. JARRETT, N.G.N.Y.  
LIEUTENANT COLONEL NATHAN STURGES JARVIS, N.G.N.Y.  
MAJOR GUY CARLETON JONES, A.M.S. CANADA.  
MAJOR W. O. KIRKPATRICK, INDIAN M.S.  
RIGHT REV. WILLIAM LAWRENCE, BISHOP OF MASSACHUSETTS.  
CAPTAIN JOSE LUGO-VIÑA, U.S. ARMY.  
MAJOR CHARLES FRANCIS MASON, U.S. ARMY.  
MAJOR VALENTINE MATTHEWS, R.A.M.C. VOLUNTEERS.  
PASSED ASSISTANT SURGEON HERMAN B. PARKER, P.H.&M.H.S.  
MAJOR JAMES EVELYN PILCHER, U.S. VOLS.  
COLONEL GEORGE STERLING RYERSON, A.M.S., CANADA.  
COLONEL NICHOLAS SENN, I.N.G.  
CAPTAIN FREDERICK HESSLER SPARRENBURGER, U.S. VOLS  
CAPTAIN MYLES STANDISH, M.V.M.  
BRIGADIER GENERAL GEORGE MILLER STERNBERG, U.S. ARMY.  
MEDICAL INSPECTOR FRANKLIN BACHE STEPHENSON, U.S. NAVY  
SURGEON JAMES S. TAYLOR, U.S. NAVY.  
LIEUTENANT COLONEL JOSEPH K. WEAVER, N.G. PA.  
SURGEON FRANCIS WILLIAM FERDINAND WIEBER, U.S. NAVY  
DR. EZRA HERBERT WILSON, OF NEW YORK.  
MEDICAL DIRECTOR JOHN CROPPER WISE, U.S. NAVY.  
LIEUT. COL. ROMAN ROMANOVITSCH DE WREDEN OF RUSSIA.

# ASSOCIATION OF Military Surgeons

OF THE UNITED STATES.

*Incorporated by Act of Congress.*



## Officers, 1903-1904.

**President,**

**MEDICAL DIRECTOR JOHN CROPPER WISE,**  
of the United States Navy.

**First Vice President,**

**SURGEON GENERAL WALTER WYMAN,**  
of the Public Health and Marine Hospital Service.

**Second Vice President,**

**MAJOR ALBERT HENRY BRIGGS,**  
of New York.

**Third Vice President,**

**BRIGADIER GENERAL ROBERT M. O'REILLY,**  
Surgeon General of the United States Army.

**Secretary and Editor,**

**MAJOR JAMES EVELYN PILCHER,**  
Captain (Retired), United States Army.

**Treasurer,**

**MAJOR HERBERT ALONZO ARNOLD,**  
Ardmore, Pennsylvania.

# Association of Military Surgeons of the United States.



THIRTEENTH ANNUAL MEETING  
ST. LOUIS, MO.  
OCTOBER 10-15, 1904.



## Committees 1903-1904.

### ADVISORY BOARD.

Hon. L. M. SHAW, Secretary of Treasury. Hon. ELIHU ROOT, Secretary of War.  
Hon. WM. H. MOODY, Secretary of Navy. Gen. ROBERT M. O'REILLY, U.S.A.  
Rear Admiral P. M. RIXEY, U.S.N. Gen. WALTER WYMAN, P.H. & M.H.S.  
Medical Director JOHN CROPPER WISE, U.S.N.

### EXECUTIVE COUNCIL.

The Officers of the Association, ex-officio, and

Major JEFFERSON R. KEAN, U.S.A. Major THOMAS C. CLARK, Minn. N.G.  
Col. R. HARVEY REED, N.G. Wyo. Surg. J. M. GASSAWAY, P.H. & M.H.S.  
Surgeon JOHN F. URIE, U.S.N. Captain MYLES STANDISH, M.V.M.

In conjunction with the Ex-Presidents, ex-officio, viz.:

Col. NICHOLAS SENN, Ill. N.G. Brig. Gen. Geo. M. STERNBERG, U.S.A.  
Brig. Gen. J. D. GRIFFITH, N.G. Mo. Colonel CHARLES H. ALDEN, U.S.A.  
Brig. Gen. A. J. STONE, Minn. N.G. Lieut. Col. JOHN V. R. HOFF, U.S.A.  
Brig. Gen. R. A. BLOOD, M.V.M.

### STANDING COMMITTEES.

#### *Literary Committee.*

Lieut. Col. JOSEPH K. WEAVER, N.G. Pa., Norristown, Pa.  
Asst. Surg. Gen. G. T. VAUGHAN, P.H. & M.H.S. Col. J. G. THOMAS, Ala. S.T.  
Surg. SHELDON G. EVANS, U.S.N. Lieut. Col. O. H. MARION, M.V.M.  
Capt. FREDK. P. REYNOLDS, U.S.A. Capt. EDWARD L. MUNSON, U.S.A.

#### *Publication Committee.*

Major JAMES EVELYN PILCHER, U.S.V., Carlisle, Pa.  
Col. WINSLOW ANDERSON, N.G. Cal. Lieut. Col. N. S. JARVIS, N.G. N.Y.,

#### *Necrology Committee.*

Capt. S. C. STANTON, Ill. N.G., 1040 Sheridan Road, Chicago, Ill.  
Surg. PHILIP LEACH, U.S.N. Brig. Gen. J. B. EDWARDS, Wis. N.G.

#### *Transportation Committee.*

Major A. H. BRIGGS, N.G. N.Y., 267 Hudson St., Buffalo, N. Y.

### SPECIAL COMMITTEES.

#### *Public Service Medical School Committee.*

Lieut. Col. JOHN VAN R. HOFF, U.S.A., Fort Leavenworth, Kansas.

#### *Committee on Legislation.*

Medical Director ROBERT A. MARMION, U.S.N., Washington, D.C.  
Brig. Gen. EDMUND C. BRUSH, O.N.G. Brig. Gen. MARSHALL O. TERRY, N.G. N.Y.  
Maj. WILLIAM C. BORDEN, U.S.A. Captain MYLES STANDISH, M.V.M.  
Lieut. Col. CHARLES ADAMS, I.N.G. P. A. SURG. C. P. WERTENBAKER, M.H.S.  
Maj. LOUIS L. SEAMAN, U.S.V.E. Col. PETER OLIVER HANFORD, N.G. Colo.  
Col. R. S. YOUNG, N.G. N.C.



4408

## The Twelfth Annual Meeting.

**Boston, Mass., May 19, 20 and 21, 1903.**

### MINUTES OF THE MEETING.

**T**HE Twelfth Annual Meeting of the Association of Military Surgeons of the United States convened in Boston, Mass., on Tuesday morning, May 19, 1903, and continued in session during the two ensuing days, with the following officers, members and delegates in attendance:

#### OFFICERS.

Brigadier General Robert Allen Blood, Surgeon General of Massachusetts, **PRESIDENT.**

Medical Director John Cropper Wise, United States Navy, **FIRST VICE PRESIDENT.**

Surgeon General Walter Wyman, Public Health and Marine Hospital Service, **SECOND VICE PRESIDENT.**

Major James Evelyn Pilcher, \*Brigade Surgeon of United States Volunteers, **SECRETARY AND EDITOR.**

Major Herbert Alonzo Arnold, Surgeon in the National Guard of Pennsylvania, **TREASURER.**

Captain William Alfred Rolfe, Assistant Surgeon in the Massachusetts Volunteer Militia, **ASSISTANT SECRETARY.**

#### MEMBERS.

Colonel Charles Henry Alden, U.S. Army, Retired.

Major Henry Allers, Surgeon, N.G.N.J.

Lieut. Col. Leonard Ballou Almy, Medical Director, Retired, Conn. N.G.

Captain George R. Anderson, Assistant Surgeon, Vt. N.G.

Major Azel Ames, \*Brigade Surgeon, U.S.V.  
 Major Walter W. Barnett, Surgeon, Ind. N.G.  
 Captain Robert E. Bell, Commanding Amb. Corps, M.V.M.  
 Major George C. Berkley, Surgeon, Vt. N.G.  
 Surgeon Henry G. Beyer, U.S. Navy.  
 Major William Cline Borden, Surgeon, U.S. Army.  
 Captain Robert Boyd, \*Assistant Surgeon, U.S.V.  
 Major Bial Francisco Bradbury, Surgeon, Me. V.M.  
 Major Albert Henry Briggs, Surgeon, N.G.N.Y.  
 Surgeon Stephen Driver Brooks, P.H. & M.H.S.  
 Lieutenant John L. Brubaker, Assistant Surgeon, N.G. Pa.  
 Brigadier General Edmund Cone Brush, Surgeon General of Ohio.  
 Surgeon Duncan A. Carmichael, P.H. & M.H.S.  
 Brig. Gen. Patrick Cassidy, \*Surgeon General of Connecticut, Retired.  
 Major Morris Franklin Cawley, Surgeon, N.G. Pa.  
 Contract Surgeon George Elliott Chamberlain, \*U.S. Army.  
 Major Frederick Rankin Charlton, Surgeon, Ind. N.G.  
 Lieutenant Emil T. Cherry, Assistant Surgeon, N.G. Pa.  
 Brevet Lieut. Col. Augustus Peck Clarke, \*Surgeon, U.S.V.C.  
 Major Thomas Chalmers Clark, Surgeon, Minn. N.G.  
 Brigadier General George Cook, \*Surgeon General of New Hampshire.  
 Lieutenant John White Cummin, Assistant Surgeon, M.V.M.  
 Captain Franclyn Elbert Davis, \*Assistant Surgeon, N.G.N.Y.  
 Lieutenant Henry Lincoln Dearing, Assistant Surgeon, M.V.M.  
 Major Howard Sumner Dearing, Surgeon, M.V.M.  
 Lieut. Col. William Henry Devine, Medical Director. M.V.M.  
 Medical Director Dwight Dickinson, U.S. Navy.  
 Major James P. Dunn, Surgeon, N.G. Cal.  
 Brigadier General John B. Edwards, Surgeon General of Wisconsin.  
 Captain H. W. Eliot, \*Assistant Surgeon, U.S.V.  
 Lieutenant Gilbert Molleson Elliot, Assistant Surgeon, Me. V.M.  
 Major Theodore W. Evans, Surgeon, Wis. N.G.  
 Major Charles Beverly Ewing, Surgeon, U.S. Army.  
 Lieut. Col. Charles Chauncey Foster, Surgeon, Retired, M.V.M.  
 Captain Romulus Adams Foster, Surgeon, D.C.M.  
 Major Edwin Motley Fuller, Surgeon, Me. V.M.  
 Major Charles William Galloupe, Surgeon, M.V.M.  
 Captain Reginald W. Garstang, Assistant Surgeon, Ind. N.G.  
 Lieutenant Frank L. Gibson, \*Ambulance Corps, M.V.M.  
 Colonel Charles Cartilidge Godfrey, Surgeon General of Connecticut.  
 Captain Thomas Page Grant, \*Assistant Surgeon, K.S.G.  
 Major Charles Montraville Green, Surgeon, M.V.M.  
 Major Lewis T. Griffith, Surgeon, U.S.V.  
 Major George Howell Halberstadt, Brigade Surgeon, N.G. Pa.

---

\*Not now in active service as such.





**Group of Officers at the Twelfth Annual Meeting.**

(Large Indexed Copies of this photograph can be obtained from E. Chickering, Boston, Mass.)

Colonel Peter Oliver Hanford, Surgeon General of Colorado.  
 Major John Franklin Harvey, Surgeon, M.V.M.  
 Lieut. Col. Norman Darrell Harvey, Medical Director, R.I.M.  
 Major Eugene Hawkins, Surgeon, Ind. N.G.  
 Captain John Frederick Hill, Assistant Surgeon, Me. V.M.  
 Lieutenant Park Howell, Assistant Surgeon, U.S. Army.  
 Brevet Major Arthur R. Jarrett, Assistant Surgeon, N.G.N.Y.  
 Lieut. Col. Nathan Sturges Jarvis, Brigade Surgeon, N.G.N.Y.  
 Major Guy Carlton Jones, A.M.S. Canada.  
 Lieutenant Edouard Albert Le Bel, A.M.S. Canada.  
 Major Francis Magurn, Surgeon, M.V.M.  
 Lieut. Col. Otis H. Marion, Medical Director, M.V.M.  
 Acting Assistant Surgeon William Henry Marsh, P.H. & M.H.S.  
 Major George William Mathews, \*Surgeon, U.S.V.  
 Lieutenant Arthur W. May, Assistant Surgeon, M.V.M.  
 Major Samuel Cargill Milligan, Surgeon, N.G. Pa.  
 Contract Surgeon Charles B. Mittelstaedt, U.S. Army.  
 Major Ralph W. Montelius, Surgeon, N.G. Pa.  
 Lieut. Col. Charles F. W. Myers, Medical Director, N.G.N.J.  
 Major William Levi Old, Surgeon, Va. V.  
 Lieutenant Richard Frothingham O'Neil, \*Asst. Surgeon, N.B.M.V.M.  
 Captain James Bernard O'Neill, Assistant Surgeon, Me. V.M.  
 Lieutenant Jacob Mark Peters, Assistant Surgeon, N.G. Pa.  
 Lieutenant Edward Warwick Pinkham, \*Assistant Surgeon, U.S. Army.  
 Lieut. Col. William Lambert Richardson, Medical Director, M.V.M.  
 Assistant Surgeon William Colby Rucker, P.H. & M.H.S.  
 Major Enno Sander, \*Quartermaster, E. Mo. M.  
 Colonel Eugene Boutelle Sanger, Surgeon General of Maine.  
 Medical Director Walter Keeler Scofield, U.S. Navy.  
 Major Louis Livingston Seaman, \*Surgeon, U.S.V.E.  
 Lieutenant Frank S. Smith, \*Ambulance Corps, M.V.M.  
 Captain Myles Standish, \*Ambulance Corps, M.V.M.  
 Captain Samuel Cecil Stanton, Assistant Surgeon, Ill. N.G.  
 Major Andrew Snowberger Stayer, Surgeon, N.G. Pa.  
 Lieutenant Joseph Cyrus Stedman, \*Ambulance Corps, M.V.M.  
 Medical Inspector Franklin Bache Stephenson, U.S. Navy.  
 Brigadier General Alexander J. Stone, Surgeon General of Minnesota.  
 Brigadier General Marshall Orlando Terry, \*Surgeon General of N.Y.  
 Lieutenant David Munson Trecartin, Assistant Surgeon, N.B. Conn. N.G.  
 Assistant Surgeon General George Tully Vaughan, P.H. & M.H.S.  
 Lieutenant Colonel Wilbur S. Watson, Medical Director, Conn. N.G.  
 Lieutenant Colonel Joseph K. Weaver, Division Surgeon, N.G. Pa.  
 Lieutenant Christopher Earle Williams, Ambulance Corps, M.V.M.  
 Surgeon Rell M. Woodward, P.H. & M.H.S.  
 Colonel Robert S. Young, Surgeon General of North Carolina.

\*Not now in active service as such.

DELEGATES.

Lieutenant Colonel Augustin Aguirre, Mexican Army.  
Lieutenant Enrico Castelli, \*Italian Army Retired.  
Colonel William Johnston Charlton, R.A.M.C. English Army.  
Colonel George Sterling Ryerson, A.M.S. Canadian Army.  
Lieutenant Colonel Robert Romanovitsch de Wreden, Russian Army.

FIRST SESSION, TUESDAY MORNING, MAY 19, 1903.

FANEUIL HALL.

The opening session of the Association was called to order by Captain MYLES STANDISH, M.V.M., Chairman of the Committee of Arrangements at 10 o'clock A. M. in the historic auditorium of FANEUIL HALL. The assembly room was decorated with the

national colors and the walls displayed numerous portraits of revolutionary and colonial heroes. Upon the stage sat the Honorable *John L. Bates* Governor of the Commonwealth, General *Samuel Dalton* Adjutant General of Massachusetts, the Right Rev. *William Lawrence* Bishop of Massachusetts, Dr. *George E. Francis* President of the Massachusetts Medical Society, Lieutenant Colonel *Augustin Aguirre* of the Mexican Army, Captain *Enrico Castelli* Italian delegate, Lieutenant Colonel *Roman Wreden* of the Russian Army, Colonel *G. Sterling Ryerson*



Captain Myles Standish.

of the Canadian Army, Colonel *William Johnston Charlton* of the British Army; Brigadier General *Robert Allen Blood* President, Medical Director *John Cropper Wise* First Vice President, Surgeon General *Walter Wyman* Second Vice President, Major

---

\*Not now in active service as such.

*James Evelyn Pilcher* Secretary, and Major *Herbert Alonzo Arnold* Treasurer; Major *Enno Sanler* of Missouri, Lieutenant Colonel *William H. Devine* of Massachusetts, and Captain *Myles Standish* and Lieutenant *Frank L. Gibson*, respectively Chairman and Secretary of the Committee of Arrangements. Music was interspersed throughout the exercises by the First Corps Cadets Orchestra. Many ladies were present and the seating arrangements were in the hands of a detail from the Ambulance Corps of the Massachusetts Volunteer Militia.

Captain STANDISH opened the meeting by introducing the Right Rev. WILLIAM LAWRENCE who invoked the blessing of God upon the sessions.

An eloquent Address of Welcome was then delivered by the Hon. JOHN L. BATES Governor of Massachusetts, on behalf of that Commonwealth.

The Mayor of Boston was also to have welcomed the Association in behalf of the municipality but was detained by important official duties.

The medical profession of Massachusetts was represented by Dr. GEORGE E. FRANCIS, President of the Massachusetts Medical So-



Lieut. F. L. Gibson.

ciety, who extended a cordial welcome in that capacity.

The annual address of the President was then delivered by Brigadier General ROBERT ALLEN BLOOD, Surgeon General of Massachusetts, President of the Association, upon "Military Medicine and Military Medical Officers." It was a careful review of the work of medical officers in improving and developing the system of medico-military aid in illness and injury, and was received with cordial applause.

The Association then adjourned, to assemble in the Boston Medical Library Building on the Fenway, at 2:00 o'clock P. M.



**The Boston Medical Library Building.**

SECOND SESSION, TUESDAY AFTERNOON MAY 19, 1903.

SPRAGUE HALL, MEDICAL LIBRARY BUILDING.

The meeting was called to order by the President at two o'clock P. M.

THE PRESIDENT: I trust you will all excuse any mistakes that I may make and the halting way in which I may carry on the meeting. This is rather a new thing to me, but I will do the best I can and will ask you to assist me.

The first business to be taken up is the appointment of an auditing committee to audit the accounts of the Secretary, and I appoint the following gentlemen on this committee:

Medical Director John C. Wise, U.S.N.;  
Ass't Surg. Gen. Geo. Tully Vaughan, P.H. & M.H.S.;  
Capt. Reginald Garstang, Assistant Surgeon, Ind. N.G.

The next thing is to appoint a committee to audit the accounts of the Treasurer, and I appoint the following gentlemen to this committee:

Major Thomas C. Clark, Surgeon, Minn. N.G.;  
Brig. Gen. Geo. Cook, Surgeon General (retired) of N.H.;  
Major W. C. Borden, Surgeon, U.S.A.

The report of the Executive Committee was then read by Major JAMES EVELYN PILCHER and on motion of Major THOMAS C. CLARK of Minn., duly seconded, was unanimously adopted.

The report of the Secretary and Editor was then read, also by Major JAMES EVELYN PILCHER Secretary and Editor.

The report recited the growth of the Association during the year throughout the various services and abroad. It noted the cordial manner in which not only our own services had responded to invitation to membership but referred also to the friendly attitude of foreign services especially England and Canada, the latter of which had issued an official order commending the Association and the JOURNAL to its medical officers. He observed that between thirty and forty thousand printed articles had been issued from the Secretary's office during the year, and that \$3762 has been received and \$3306 had been expended. He commented upon the change of the JOURNAL from a quarterly to a monthly and recited some of the advantages accruing therefrom, noting especially the fact while last year the Association received 814 pages, 300 pages more than the preceding volume, the two volumes for the Association year 1902-1903 amounted to still 300 pages more than that year. In conclusion, he congratulated the Association upon its unprecedented growth, remarking that "it is now the largest Medico-Military Association in the world and has become the subject of complimentary comment in all corners of the

earth. The medical press of India, Austria, Great Britain and many other foreign powers, has referred to its work in terms of unstinted praise. Its influence is gaining by daily accretions, although the burden of carrying forward its work in such manner as to continue to maintain its present position, is constantly increasing in weight. We may look forward then, to a period, when, through the efforts of the Association, the Medical Departments of the various Military and Naval forces may have



**Interior of Sprague Hall, Medical Library Building.**

emerged from the condition of subordination, inherited from the barber-surgeon, to the plane of altruistic influence upon which all honor and all justifiable authority shall be freely conceded to them."

On motion of Captain THOMAS PAGE GRANT, of Kentucky, duly seconded, the report was received and referred to the Auditing Committee for the Secretary's Accounts, and a vote of thanks was unanimously tendered Major Pilcher.

The report of the Treasurer was then read by Major HERBERT A. ARNOLD Treasurer, showing total receipts during the year of \$8010.23 and total disbursements of \$3227.83, leaving a balance of \$4782.40, an increase over last year's balance of \$530.14. On motion of Lieut. Col. J. K. WEAVER, Penna., duly seconded, the report was received and referred to the Auditing Committee for the Treasurer's Accounts.

The Literary Committee submitted the Program of the meeting as its report.

The report of the Necrology Committee was next read by Lieut. Col. N. S. JARVIS, N.G.N.Y. and on motion of Major AZEL AMES, U.S.V. duly seconded, was accepted by a unanimous vote, in silence and standing, and referred to the Publication Committee.

The report of the Public Service Medical School Committee was next read by the Secretary for Lieut. Col. JOHN VAN RENSSELAER HOFF, who constituted the Committee.

The report was discussed, upon invitation, by Colonel R. R. DE WREDEN, Adjunct Professor in the Imperial Military Medical Institute of St. Petersburg, Russia, delegate from the Russian Army and on motion of Major THOMAS C. CLARK, Minn., duly seconded, was accepted and referred to the Executive Council.

On behalf of the Incorporation Committee Major W. C. BORDEN, U.S.A., said: "I am the chairman of the Incorporation Committee and my report is necessarily a brief one. All that the Committee has to report is that the act of incorporation has passed and that the work which the Committee undertook to do has been done." (Applause).

Major JAMES EVELYN PILCHER, U.S.V.: "Major Borden's modesty prevents him from doing himself justice in this matter. I do not believe he will thank me for adding anything to what he has said; nevertheless, I think it is due ourselves that we should know that the Committee on Incorporation has not had an absolutely smooth course; that it has met obstacles which have been most ingeniously and diplomatically overcome; that the chairman of the Committee was the original deviser of the plan for incorporation which promises to be of so much advantage to the Association; and that for the success of the work of the Committee



we owe a great deal to Major Borden as well as to Col. Marion and the other members of the Committee. I would therefore move you, Mr. President, that a vote of thanks be tendered to Major Borden and to his Committee for the faithful and successful work which they have accomplished in connection with the work of incorporating the Association."

This motion was seconded by Major THOMAS C. CLARK, Minn., and being put to a vote was unanimously carried.

MAJOR W. C. BORDEN, U.S.A.: "I wish to thank the Association for its courtesy, but in accepting for myself and the Committee this vote of thanks it would be hardly just for me not to speak of the able assistance which I have received from many members of the Association, including its President, as well as certain members of the Senate and House who have taken the matter up and cooperated with us.

The report of the Enno Sander Prize Medal Board of Award was read by the Secretary and, the majority of the Board awarding first place to the author of the essay presented under the nom de plume of "Byamow-Byamow," and the second place to the author of the essay offered under the nom de plume "William von Rothenburg," the report was unanimously adopted. The sealed envelopes containing the names of the officers competing under these noms de plume were then opened in the presence of the Association and found to be as follows:

"Byamow-Byamow," Major FREDERICK SMITH, D.S.O., R.A.M.C.

"William Von Rothenburg," Assistant Surgeon WILLIAM COLBY RUCKER, P.H. & M.H.S.

The winner of the prize, Major Frederick Smith of the Royal Army Medical Corps, Wiltshire, England, not being present to read his essay, the paper upon the Differential Diagnosis of Typhoid Fever in its Earliest stages, adjudged second in point of merit was read by its author, Dr. WILLIAM COLBY RUCKER, P.H. & M.H.S.

Great applause greeted Dr. Rucker as he concluded, and in response to the President's request Surgeon General Walter Wyman, P.H. & M.H.S., Surgeon H. G. Beyer, U.S.N., and Col. Wreden of the Russian army discussed the paper.

Lt. Col. J. K. WEAVER, Penna., then introduced the following:

## **Resolutions on the Sanitation of the Isthmian Canal.**

**Whereas**, it is well known that the previous excavations for an Isthmian Canal have been attended with a large amount of illness and a heavy mortality due mainly to Malaria and Yellow Fever, and

**Whereas**, recent discoveries as to the cause of these diseases, have enabled Medical Officers to control their ravages to a marked degree, and

**Whereas**, the success which has crowned medical efforts in Cuba in abolishing Yellow Fever in the Island, almost banishing Malaria from Havana and entirely eradicating Malaria as a factor of the death-rate of the Army in Cuba, is conclusive evidence that, if proper hygienic precautions are taken at Panama and other situations, along the route of the projected interoceanic canal, the death-rate of the past can be diminished and practically made to disappear; therefore be it

**Resolved**, that in the judgment of the Association of Military Surgeons of the United States, in annual meeting assembled, the amplest power should be given to the medical officers in charge of the sanitation of the Canal, and that, to attain this end, the Medical Officer in charge should be a member of the commission, which the President of the United States is authorized to appoint to conduct the affairs of the Canal; and be it further

**Resolved**, that the Secretary of the Association is instructed to forward this preamble and resolutions, properly attested, to the President of the United States.

Major THOMAS C. CLARK, Minn., moved the adoption of the preamble and resolution as read, which being duly seconded was unanimously carried.

The report of Brig. Gen. JEFFERSON D. GRIFFITH, Missouri, as delegate to the Fourteenth International Medical Congress at Madrid was then presented and referred to the Publication Committee.

*MINUTES OF THE TWELFTH ANNUAL MEETING.* 13

The Secretary then presented invitations for the Association to hold its next annual meeting as follows:

BUFFALO, N.Y.—From the Buffalo Merchant's Exchange.

SAN FRANCISCO, CAL.—From the Hon. George C. Pardee, Governor of California.

ST. LOUIS, MO.—From the Hon. David R. Francis, President of the Louisiana Purchase Exposition;

The Business Men's League of St. Louis;

Hon. Rolla Wells, Mayor of St. Louis;

Hon. Edward A. Faust of St. Louis.

On motion of Major THOMAS C. CLARK, Minn., duly seconded, the invitations were referred to the Nominating Committee, when it should have been appointed.

The meeting then on motion adjourned until 10 o'clock the following morning.

THIRD SESSION, WEDNESDAY MORNING, MAY 20, 1903.

SPRAGUE HALL, MEDICAL LIBRARY BUILDING.

The Association was called to order at ten o'clock A. M., by the President.

The literary program was taken up, the first paper being The Education of the Medical Officer, by Major WILLIAM C. BORDEN, U.S.A. This was read by the author, and was extensively discussed by Surgeon H. G. Beyer, U.S.N., Col G. Sterling Ryerson, Canadian Army, Col. R. R. Wreden of the Russian Army, Col. W. J. Charlton of the British Royal Army Medical Corps, Medical Director John C. Wise, U.S.N., Major Azel Ames, U.S.V., Lt. Col. Charles C. Foster, M.V.M., Brig. Gen. E. C. Brush, Surg. Gen. of Ohio, Lt. Col. N. S. Jarvis, N.G.N.Y., Major Guy Carleton Jones, of the Canadian Army, Lt. Col. J. K. Weaver, Penna., and the author.

The following papers were read by title only and referred to the Publication Committee:

The Degree of Doctor of Public Health. By Medical Director P. FITZSIMONS, U.S.N.

The United States Army General Hospital at the Presidio of San Francisco, California, 1901-1902. By Col. ALFRED C. GIRARD, U.S.A.

Some Problems for Solution by the Medical Department of the Army. By Lieut. Col. JOHN VAN RENSSELAER HOFF, U.S.A.

My First Aid to the Wounded; the Trip of the Steamer S. R. Spaulding, Transporting our Wounded Prisoners from City Point, Va., to Philadelphia after the Seven Days Battles in 1862, was read by the author, Lieut. Col. HENRY O. MARCY, U.S.V., and evoked much applause.

The Examination of Recruits for the National Guard, by Col. WILLIAM T. MAYBURY, Me. V.M. was read by title and referred to the Publication Committee.

The Sanitary Condition of the Town of Surigao, Mindanao, Philippine Islands, by Captain HENRY DU R. PHELAN, U.S.V. was read by title and referred to the Publication Committee.

The Surgeon Generals of the Army from the Revolution to the Close of the Rebellion in the Philippines. By Major JAMES EVELYN PILCHER, U.S.V. The author requested that his paper be read by title and referred to the Publication Committee, and that his time be placed at the disposal of the delegate from the Mexican Army, which was unanimously approved.

Spinal Anesthesia in Military Surgery. By Lieut. Col. AUGUSTIN AGUIRRE, of the Mexican Army. This paper was read by Major AZEL AMES, U.S.V., the author, who was present, not considering his pronunciation of English sufficiently good. On motion, it was received and referred to the Publication Committee.

The following papers were read by their respective authors and were on motion accepted and referred to the Publication Committee:

New England Men in the Medical Corps of the Navy of the United States. By Medical Inspector FRANKLIN BACHE STEPHENSON, U.S.N.

Service Conditions, Retirement and Pensions. By Medical Director JOHN C. WISE, U.S.N.

The next order of business being the appointment of the Nominating Committee, the following designations were duly made:

NOMINATING COMMITTEE, 1903.

SERVICE OR STATE.	NO. OF VOTES.	REPRESENTATIVE.
Army	24	Major W. C. Borden, U. S. A.
Navy	18	Med. Dir. Dwight Dickinson, U.S.N.
P.H. & M.H.S.	10	Asst. Surg. Gen. G. T. Vaughan.
California	1	Major J. P. Dunn, N.G. Cal.
Colorado	1	Col. P. O. Hanford, Col.
Connecticut	2	Lt. Col. W. S. Watson, C.N.G.
District of Columbia	1	Lt. R. A. Foster, D.C.M.
Illinois	8	Capt. S. C. Stanton, Ill. N.G.
Indiana	1	Major W. W. Barnett, I.N.G.
Kentucky	1	Capt. T. P. Grant, K.S.G.
Maine	1	Col. E. B. Sanger, Me. V.M.
Massachusetts	4	Lt. Col. W. H. Devine, M.V.M.
Minnesota	1	Gen. Alex. J. Stone, M.N.G.
Missouri	1	Major Enno Sander, Mo.
New Hampshire	1	Gen. Geo. Cook, N.H.
New Jersey	1	Lt. Col. Chas. F. W. Myers, N.G.N.J.
New York	5	Lt. Col. N. S. Jarvis, N.G.N.Y.
North Carolina	1	Col. R. S. Young, N.C.N.G.
Ohio	4	Brig. Gen. E. C. Brush, O.N.G.
Pennsylvania	4	Lt. Col. J. K. Weaver, N.G.P.
Vermont	1	Major T. C. Berkeley, V.N.G.
Virginia	1	Major Wm. L. Old, Va. V.
Wisconsin	1	Brig. Gen. John B. Edwards, W.N.G.

The members of the Nominating Committee were requested to meet at the Hotel Lenox at seven o'clock Wednesday evening.

On motion, the meeting adjourned.

FOURTH SESSION, WEDNESDAY AFTERNOON, MAY 20, 1903.

JOHN WARE HALL, MEDICAL LIBRARY BUILDING.

The meeting was called to order by the President at 2:30 o'clock P. M.

The Secretary then read the following telegram received from the Association of Medical Officers of the Army and Navy of the Confederacy:

NEW ORLEANS, LA., May 19, 1903.

To the Association of Military Surgeons of the United States,

Major J. E. Pilcher, Secretary.

The Association of Medical Officers of the Army and Navy of the Confederacy at regular meeting assembled in New Orleans, La., respectfully beg leave to tender fraternal greetings to the Association of Military Surgeons of the United States. From the Gulf do we desire to extend a cordial grasp of professional fellowship to the members of that Association representing the medical staff of the army and navy of a glorious and united nation.

DEERING J. ROBERTS, M.D. Secretary.

W. J. W. KERR, M.D., President.

The following reply was then suggested and duly authorized:

BOSTON, MASS., May 20, 1903.

To the Association of Medical Officers of the Army and Navy of the Confederacy,

Dr. Deering J. Roberts, Secretary, New Orleans, La.

The Association of Military Surgeons of the United States cordially reciprocates the fraternal greetings of the Association of Medical Officers of the Army and Navy of the Confederacy. While the breadth of a continent intervenes between our sessions, our hearts unite with you in that common aim of alleviating suffering which knows no north, no south, no east, no west, but a united country and an international recognition.

JAMES EVELYN PILCHER, Secretary.

ROBERT ALLEN BLOOD, President.

The literary program was then taken up, and Major AZEL AMES, U.S.V., read a paper entitled The Acting Assistant Surgeon, U.S.A.

The next paper to be read was by Surgeon HENRY G. BEYER, U.S.N. On the Prevention of the Spread of Infectious Diseases on Board Ship, which was discussed briefly by Medical Director John C. Wise, U.S.N.

General Herbert L. Burrell, Mass., then entered the room accompanied by Surgeon General Johann Mikulicz, of the Sixth Army Corps of Silesia, whom he introduced to the President.

THE PRESIDENT: "It gives me great pleasure to introduce you to our Association. We are very happy to see you."

SURGEON GENERAL MIKULICZ: "I am very thankful to you for your kind greeting. I am very sorry that my time is so limited that I cannot take an active part in your proceedings, as I should much like to do so." (Applause.)

The literary program was then resumed and the following papers were read by title and referred to the Publication Committee:

Epidemic Catarrh on Shipboard. By Passed Assistant Surgeon DUDLEY N. CARPENTER, U.S.N.

Remarks on the History, Cause, and Mode of Transmission of Yellow Fever, and the Occurrence of Similar Types of Fatal Fevers in Places where Yellow Fever is not known to have Existed. By Lieut. JAMES CARROLL, U.S.A.

The Pathology of Latent Malarial Infection as observed at Autopsy. By Lieut. CHARLES F. CRAIG, U.S.A.

A paper upon Leprosy as seen in the Philippines. By. Major CHARLES B. EWING, U.S.A. was then read by the author.

An Epidemic of Diphtheria on Board the U. S. Training Ship Buffalo. By Medical Inspector G. E. H. HARMON, U.S.N. Read by title and referred to the Publication Committee.

Report of a Case of Malarial Sciatica. By Surgeon ELON O. HUNTINGTON, U.S.N. Read by title and referred to the Publication Committee.

Notes from the Experiences of a Medical Officer in the Tropics. By Major CHARLES F. MASON, U.S.A. Read by title and referred to the Publication Committee.

A paper upon the Medical Treatment of Appendicitis in Accordance with Modern Views of Therapeutics, by Lieut. ENRICO CASTELLI, Italian Delegate, was read by the author.

The following papers were read by title and referred to the Publication Committee:

A Mounted Bearer Company. By Lieut. H. G. HATHAWAY, R.A.M.C.

The United States Naval Medical School. By Medical Director ROBERT A. MARMION, U.S.N.

The Preservation of the Soldiers's Health. By Brigade Surgeon Lieut. Col. WILLIAM HILL-CLIMO, A.M.S., England.

The Instruction of the Hospital Corps in Companies and Detachments. By Capt. FREDERICK P. REYNOLDS, U.S.A.

Yellow Fever at Las Animas Hospital—the Hospital of the Sanitary Department during the Epidemic of 1900 at Havana, Cuba. By Col. WILLIAM C. GORGAS, U.S.A.

Quarantine as the Picket Line. By Surgeon PARKER C. KALLOCH, P.H. & M.H.S.

Hysteria in the Male. By Surgeon SHELDON G. EVANS, U.S.N.

A Note on the Surgical Experiences of the Boer War. By Surgeon General W. F. STEVENSON, A.M.S., England.

On motion, the meeting adjourned.

FIFTH SESSION THURSDAY, MORNING MAY 20, 1903.

SPRAGUE HALL, MEDICAL LIBRARY BUILDING.

The meeting was called to order by the President at ten o'clock A. M.

The literary program was taken up and the first paper presented was The Public Health and Marine Hospital Sanatorium at Fort Stanton, N. M. By Surgeon PAUL M. CARRINGTON, P.H. & M.H.S. The author not being present a synopsis of the paper was read by Asst. Surg. Gen. GEORGE TULLY VAUGHAN, P.H. & M.H.S.

Capt. THOMAS PAGE GRANT, Asst. Surg. K.S.G., then exhibited and described an external suture which he had devised, Corporal Moore of the Ambulance Co., M.V.M. kindly allowing himself to be used to demonstrate the features of the dressing.

The next paper submitted was A Case of Intradural Hemorrhage without Fracture, caused by a Foot-ball Injury; Operation followed by Recovery. By Surgeon F. W. F. WIEBER, U.S.N. This was read by title and referred to the Publication Committee.

The Treatment of Dislocation of the Shoulder,—Report of a Case in which the Detached Greater Tuberosity prevented Reduction, by Assistant Surgeon General GEORGE TULLY VAUGHAN, P.H. & M.H.S. was read by the author.

Some Observations on the Fracture of the Skull, by Capt. ROBERT E. BELL, Ambulance Corps, Mass., was read by the author and discussed briefly by Major Thomas C. Clark, Minn.

Sixteen Cases of Abscess of the Liver; Diagnosis and Operation, at the Military Hospital, Iloilo, Panay, P. I., August 5, 1900 to April 20, 1901, by Lieut. EDWARD W. PINKHAM, U.S.A. was read by the author.

The Auditing Committee on the Treasurer's Accounts then reported them to be correct, and recommended (1) that he be hereafter authorized to employ a professional auditor whose report shall be accepted by the Association (2) that he be hereafter paid an annual compensation of \$300.00 and (3) that his expenses in attending the annual meetings be borne by the Association. On motion of Lieut. Col. O. H. MARION, Mass., duly seconded, these recommendations were adopted.



The **PRESIDENT** then announced that the foreign delegates who had at this meeting been elected to Corresponding Membership in the Association, would now be formally decorated with the insignia by the Secretary, it being explained that the other foreign delegates had previously received it.

Lieut. Col. Augustin Aguirre of the Mexican Army and Lieut. Col. R. R. de Wreden of the Russian Army then stepped forward and were addressed as follows by Major **JAMES EVELYN PILCHER**, the Secretary:



**Foreign Delegates and Associate Members.**

Reading from left to right the officers are Major G. C. Jones, Canada; Lieut. E. Castelli, Italy; Lieut. Col. A. Aguirre, Mexico; Lieut. Col. R. R. de Wreden, Russia; Col. W. J. Charlton, England; Lieut. E. A. Le Bel, Canada; with Major H. A. Arnold, Pa. and Lieut. Col. O. H. Marlon, Mass. on the right.

"I have the honor on behalf of the President and members of the Association of Military Surgeons to inform you that as representatives of your governments I have been directed to decorate you with the insignia of the Association of Military Surgeons of the United States. This insignia is conferred upon you not only because of your high professional rank in the countries which you so worthily represent, but also because of the high es-

teem in which we hold the countries from which you come, and in recognition of that international comity which,—whatever differences may exist between the combatant bodies of the various countries of the world,—always prevails between the medical men. There is never any war between the medical departments of any two countries. We are bound together, separated though we may be in language and national boundaries, in that common function of alleviating the suffering not only of our own soldiers but of the soldiers of those whom we are pleased, simply for the time being, to feel as our enemies.

“Col. Aguirre, it gives us particular pleasure to bestow upon you as an officer of the medical department of our neighboring republic this insignia. We have for Mexico the highest regard not only because she is our neighbor, but because of the very kindly and friendly relations which have so long existed between us; and for this reason, Sir, it gives us very great pleasure to confer upon you the grade of corresponding member in this Association and to place this decoration upon your breast.

“Col. Wreden, as the representative of one of the greatest nations of the earth you have come to us; you have been active in our meetings; you have given to us of that knowledge which you possess and for which we are seeking. We have then very great pleasure, out of personal respect for you and out of the great honor in which we hold your mighty government, of conferring this decoration upon you.” (Applause.)

COL. WREDEN: “Mr. President and gentlemen: Allow me to thank you with all my heart for the high honor bestowed upon me. I count this honor very high for me, as the United States are highly esteemed and much admired in Russia. The friendship of Russia for the United States has, as you know, been proved not only by words but in hard times by deeds. I count myself very happy to be the representative of Russia upon this occasion and to meet the representatives of this great nation, of the glorious future of which we Russians are perfectly sure.” (Great applause.)

Col. Aguirre, feeling diffident of his ability to speak fluently in English, bowed his thanks for the decoration conferred upon him.

THE SECRETARY: "It should be said also that we have with us Col. Charlton from the British government who happens just at this moment to be absent, but upon whom, with the consent of the President, the decoration will be conferred privately."

The report of the Nominating Committee was then submitted by Lieut. Col. J. K. WEAVER, Penna., Secretary of the Committee as follows:

For *President*, Medical Director JOHN C. WISE, U.S. Navy.

*1st Vice President*, Surg. Gen. WALTER WYMAN, P.H. & M.H.S.

*2d Vice President*, Major ALBERT H. BRIGGS, N.G.N.Y.

*3d Vice President*, General ROBERT M. O'REILLY, U.S. Army.

*Treasurer*, Major HERBERT A. ARNOLD, N.G. Pa.

For place of the next meeting: ST. LOUIS, Mo.

Time of next meeting: A date to be fixed by the Executive Council.

The Secretary of the Association being a permanent official, no nomination is made, the office being continuously held by Major JAMES EVELYN PILCHER, U.S.V.

Major THOMAS C. CLARK, Minn.: "The committee recommends St. Louis for the place of meeting next year. There has been some question in regard to accommodations, and something therefore may come up to make it advisable to go somewhere else. I think that not only the date of the meeting but the place of the meeting should be left to the Executive Council. If the accommodations in St. Louis should be of such a nature that we could not go there, some other place could be selected. I move, therefore, to amend the report by leaving both the date and place of the next meeting in the hands of the Executive Council."

Lieut. Col. J. K. WEAVER, Penna.: "That would be entirely agreeable to the Committee."

The motion being duly seconded was unanimously adopted.

On motion of Major AZEL AMES, the Secretary was instructed to cast one ballot for the officers nominated by the Nominating Committee, and the SECRETARY, having complied with the motion, announced that he cast the ballot for the officers named in the report of the Nominating Committee.

The new President, Medical Director JOHN C. WISE, U.S.N., was then installed and addressed the Association as follows:

"Mr. President and gentlemen: If I had the gift of eloquence which characterizes our Secretary, I would make you an address. But it is the privilege of a sailor to be laconic, and I will certainly exercise that privilege on this occasion.

"I cannot tell you how much and how deeply I am gratified by the honor you have done me. At this time I am led to reflect on the first meeting of the Association that I attended at Philadelphia and the great changes that have come over us in that short time,—our largely increased membership, our highly satisfactory financial condition, the publication of an influential and authoritative journal, and the incorporation of the Association by Congress whereby we are given official status and vested with prestige by the government. It is unnecessary for me to say, gentlemen, that this result has not been the work of any one man or set of men, but rather of the body of the Association. This is as it should be. Many of the men who ploughed deepest in the planting of this Association have departed from this life or are no longer in active membership. The results in the general body are such as they should be. No President, however laborious, no body of officers, however capable and earnest, can do adequate work unless they have the cooperation of the great body of the Association. It is unnecessary for me to say that if St. Louis should be selected as our next place of meeting, how important it is that everyone should do all that lies within him to make that meeting a success. I have heard that it has been proposed to put some limitation upon the character of papers that should be submitted to this Association, but I say, gentlemen, I would not adopt any such limitation. We are here not so much to improve others as to improve ourselves. We are but a mere nucleus, and we have a large body of members scattered over the broad seas. We want to encourage those young men to put their thoughts upon paper. If I could say one word to this Association and to the members to whom our JOURNAL goes, I would say: 'Produce, Produce. If it is the infinitesimal atom of nothing, in God's name produce it.'

"Finally, gentlemen, I beg to assure you that I shall give my best abilities to the discharge of the duties of the position with which you have honored me." (Applause.)

Brig Gen. ROBERT A. BLOOD: "It gives me great pleasure to resign my office to Medical Director Wise. I know that I leave the office of President in most worthy hands. I appreciate all the kindness that has been shown me since I have been President of the Association, Perhaps you do not realize the position I was in when I accepted the presidency. The business of an office like this is something that was entirely foreign to my life. As you have seen, I am not acquainted with parliamentary laws and all that sort of thing, and I have not time to take them up at this late day in my life; but I have tried to do my duty and to work for the interests of the Association, and I think the Secretary will bear me out in this.

"I believe in this Association, and I trust the future will be far more profitable than the past, and that we shall go on and at no distant day become one of the most influential medical bodies in the world. I see no reason why we should not. Because a man is a surgeon or a medical officer in the army, navy or militia, that is no reason why he should not become just as prominent in the medical world as any man in civil life. We must all work for one end, and that is for the glory and the extension of this Association." (Applause.)

The following resolutions of acknowledgement were, upon motion of Major THOMAS C. CLARKE, Minn., duly seconded, unanimously adopted:

**Whereas**, the twelfth annual meeting of the Association of Military Surgeons of the United States has been one of the most profitable and enjoyable in its history, and

**Whereas**, this has been the result of the cordial cooperation of the friends and officers of the Association, therefore be it

**Resolved**, that this Association gratefully acknowledges its indebtedness to the Committee of Arrangements for the splendid preparations and generous contributions to the comfort and pleasure of the Association.

**Resolved**, that especial recognition is due Captain MYLES STANDISH Chairman, and Lieutenant FRANK L. GIBSON, Secretary of the Committee of Arrangements for their indefatigable ef-

forts, judicious combination of interests and for the agreeable manner in which their work has been carried out.

**Resolved**, that the thanks of the Association are tendered to his Excellency, Governor JOHN L. BATES, the Right Reverend WILLIAM LAWRENCE and Dr. GEORGE E. FRANCIS, President of the Massachusetts Medical Society for the courteous reception given by them to the Association.

**Resolved**, that the Association gratefully appreciates the hospitality of the First Corps Cadets, Colonel THOMAS F. EDMANDS commanding, the First Massachusetts Heavy Artillery, Colonel JAMES B. FRYE commanding, and the Massachusetts Ambulance Corps, Captain ROBERT E. BELL commanding.

**Resolved**, that the thanks of the Association are extended to Dr. HENRY O. MARCY, the Tavern Club and the Ancient and Honorable Artillery Company for the sumptuous manner in which they have entertained the Association.

**Resolved**, that the thanks of the Association are tendered to the President and Trustees of the Museum of Fine Arts in opening their magnificent institution to the members and guests of the Association.

**Resolved**, that the Association desires to express its cordial appreciation of the courtesy of the Massachusetts Automobile Club in providing the superb excursion to Lexington and Concord; to Captain A. M. PALMER, Quartermaster, U.S. Army for the excursion about Boston harbor tendered by him to the Association, and to General WILLIAM A. BANCROFT, President of the Boston Elevated Railway Co., for transportation courtesies extended to the Association.

**Resolved**, that the cordial appreciation of the Association is extended to General and Mrs. ROBERT ALLEN BLOOD, both for the hospitalities displayed by them in the public reception at the Armory of the First Corps Cadets and for the equally generous entertainment which the Association received at their beautiful home near Bunker Hill.

**Resolved**, that the thanks of the Association are heartily extended to Mrs. LULU S. UPHAM, Chairman of the Committee for the Entertainment of the Ladies accompanying the Members of the Association, for her efficient, cordial and courteous con-

duct of the duties which she assumed; to Mrs. SAMUEL ELLIOT, Mrs. ESTELLE HATCH MERRILL, MISS ALICE LONGFELLOW and the New England's Women's Press Association for their hospitality to the ladies accompanying the members of the Association.

**Resolved**, that the thanks of the Association are due the University Club, the Algonquin Club and in particular the Boston Medical Library Association for the hospitality extended to the Association.

**Resolved**, that the courtesy of the New England Passenger Association in extending the reduced rates to the members of the Association, notwithstanding, the Association's failure to fully comply with their requirements; and the uniform courtesy and generous hospitality with which Messrs. Ainslie & Grabow, proprietors of the Hotel Lenox, have unfailingly met all the wants of the Association is recognized with hearty thanks.

**Resolved**, that the thanks of the Association are especially extended to the officers who have conducted its work so efficiently during the year now past; to General ROBERT ALLEN BLOOD, President, for the dignified and effective manner in which he has conducted the duties of the Presidency; to Major JAMES EVELYN PILCHER, Secretary and Editor, for his efficient and successful labors as secretary, editor and publisher, by which the membership of the Association has been largely increased and its influence widely extended; to Major HERBERT A. ARNOLD, Treasurer, for the skill and integrity with which he has managed the funds of the Association and collected the amounts due it from many sources.

The work of the twelfth annual meeting then having been entirely despatched, the Association, upon motion, duly adjourned to meet at such time and place in 1904 as may be determined by the Executive Council.

## The Opening Session.

Captain MYLES STANDISH, (Chairman of the Committee of Arrangements) called the meeting to order and requested attention to the invocation:

### INVOCATION.

BY THE RIGHT REV. WILLAM LAWRENCE, S.T.D.,  
BISHOP OF MASSACHUSETTS.

**O**H, Almighty God, as Thou wast with our fathers, so let Thou be with us. As in the spirit of a loving faith and with a deep sense of duty they made their mark, so in the same faith and with the same sense of duty may it be given to us to do our part for this people. Pour out Thy spirit, we beseech Thee upon this whole nation. Give Thy blessing to the President of the United States and all others in authority. May our people here and in torrid climes be bound together in one sympathetic bond toward the uplifting of civilization and their fellow-men. We give Thee hearty thanks for the lives of those who have been given in Thy service, in the field, in the hospital, and in the camp. We praise Thee for those who that the people may be kept in strength of body have given themselves up even unto death. Pour out Thy spirit



The Right Rev. William Lawrence.

upon us now, direct us in all our doings with Thy most gracious



favor, and further us with Thy continual help that all our works being done, continued, and ended in Thee we may call Thee Thy holy name and say in this life and in the life to come, our fellow-man. For Christ's sake, Amen.

Captain MYLES STANDISH, Chairman: I trust that all the members of the Association of Military Surgeons of the United States may find these exercises profitable and enjoy themselves on this occasion. It is not for me, however, to offer welcome. The welcome of the Commonwealth of Massachusetts will be extended to you by His Excellency, Governor Bates.

### THE COMMONWEALTH OF MASSACHUSETTS.

BY HONORABLE JOHN L. BATES, LL.D.,  
GOVERNOR OF MASSACHUSETTS.

THE Chairman has placed me right in the start. I see that the person who made out the program designated the few remarks that I am to make as an address, but the Chairman says it is to be merely a word of welcome, and he is right. That is what I am here for. I should not attempt to address this gathering because it has assembled to discuss matters of which I am informed only in a very general way. But when it comes to saying a word of welcome on behalf of the old Commonwealth of Massachusetts to men who come in such a cause as you come, it is indeed a pleasure for her executive to attempt to do that.

It is a pleasure to see upon this platform and in this audience representatives of the sister states of the Union and also those who come representing other nations—England, Mexico, Italy, Russia and others. We welcome them to a commonwealth which has a large percent-



Hon. John L. Bates.

age of citizenship made up from those who came from their lands and a citizenship that does their home land honor and their adopted land credit. It is specially pleasant to welcome those who come from sister states because of the law in this nation which hardly permits us to recognize even for political purposes any barriers whatever between our states. It is particularly pleasing to welcome you in this old hall that for many scores of years has been devoted to the liberties of mankind and in a hardly less degree to the humanities of the age. Pleasant would it be to welcome you did you come merely as representatives of your various home states and lands—pleasant though you came only to look at our historic spots, to interest yourselves in our history, our advancement, and our institutions—but doubly pleasant is it to speak a word of welcome when I recognize that you come as a band of men organized for the purpose of alleviating the hardest conditions of warfare and the hardest conditions of life. It is a pleasure as I recall the fact that above the seal of Massachusetts there is always the outstretched sword, to remember that below is the legend that indicates that the sword is never to be used except that the people of the state may enjoy the blessings of liberty and of peace. And so I recognize that while in a way your profession is connected with that of warfare, I recognize that it is to the alleviation of suffering, to the staunching of wounds, and to the preservation of life that your energies are particularly directed. I therefore give you a double welcome to the Commonwealth of Massachusetts. We thank you for bringing so many of the ladies with you. We trust that all the hours you stay here may be hours of pleasantness and that as a result of your deliberations and counsels there may come much that shall mean the advancement of your honorable profession. (Prolonged cheers and applause.)

Captain MYLES STANDISH, Chairman: We gentlemen of the National Guard, who are civilians except when in uniform, are very proud of our brothers in the regular service who have done so much in the last four or five years to promote the welfare of the lands to which they have been sent, and we feel sure that the single act of our brethren of the regular service in discov-

ering the origin of yellow fever will repay to the United States the entire cost of the Spanish War. We now wish to give you welcome in the name of the medical men of Massachusetts, and I introduce to you Dr. George E. Francis, President of the Massachusetts Medical Society.

## THE MASSACHUSETTS MEDICAL SOCIETY.

By GEORGE E. FRANCIS, M.D.

PRESIDENT OF THE MASSACHUSETTS MEDICAL SOCIETY.

**I**T gives me very great pleasure to extend a most hearty welcome to the members of this Association on behalf of the Massachusetts Medical Society. We are glad to see you here in this, our chief city, gathered in this historic hall, the nursery of so many patriotic movements.

In your organization we see a repetition of the union of states. Your parts are many and diverse, but they join together into one harmonious whole. For each component in your framework we have a ready welcome. Surely in Massachusetts the medical officer of the United States Army or the United States Navy will never fail to find warm hospitality among his medical brethren. Indeed there are not a few of us left who were surgeons in the army or the navy of forty years ago—perhaps did active work in both services. Your work, your duties, your opportunities, are sure of appreciation in this community at least.

The Massachusetts Medical Society is soon to gather for its 122d annual meeting.

It is as old as the nation. I shall spare you any details of its



Dr. George E. Francis.

history; and will only remind you that it has seen war come upon the country on several occasions, and each time the country was caught most woefully unprepared in every respect. But in this matter we have not been greater sinners than other nations, for all modern history points the same moral. Let us be thankful for one Association which helps to keep us reasonably ready. The fear of the Lord is a praiseworthy state of mind; it is well, also, to keep one's powder dry.

More than forty years ago I was for some time on the medical staff of a United States marine hospital, and it is but natural that I should have followed with keen interest the steady development of that branch of the government service and the very fine quality of much of its recent work. By something of a paradox, I find that the department of your Association which appeals to me most strongly is a field of usefulness in which I have had no personal experience. It would seem, however, that everything which relates to the perfect efficiency of the National Guard is already a matter of vital importance to every citizen. No thinking person can study the evolution of the struggle now on between capital and organized labor without reaching the fear if not the conviction that the stability of our institutions may, for a time at least, be found to depend upon the loyalty, the discipline, and the efficiency of local militia companies. The National Guard as a whole and in all its parts stands for law, order, and justice, as against anarchy. So may it ever stand! I hope that this branch of your Association is to be largely represented here, and that it will go on in numbers, in knowledge, and in energy.

A hearty welcome then to one and all, from far and from near. May your counselling be wise and profitable! May your days here be happy ones! Best of all—may your ties of fellowship multiply and grow strong! (Applause.)

Captain MYLES STANDISH: We will now listen to the Annual Address of the President of the Association, General Robert Allen Blood, Surgeon General of Massachusetts.

# The President's Annual Address.

## MILITARY MEDICINE AND MILITARY MEDICAL OFFICERS.

BY BRIGADIER GENERAL ROBERT ALLEN BLOOD,  
SURGEON GENERAL OF MASSACHUSETTS.

**I**T gives me great pleasure, as President of the Association of Military Surgeons and a citizen of this ancient Commonwealth, to welcome you, one and all, to this historic hall and to the city of Boston; and I am pleased, as the official head of the Medical Department of the Massachusetts Militia, to give you a hearty welcome in its name. I want you to feel that this is not a formal greeting, but a most friendly, cordial welcome that I extend to you.

Most of our surgeons who belong to the Massachusetts Militia had cause to meet many of you in the field during the Spanish War. I think those surgeons who had that honor will take particular pleasure in making your visit here a pleasant and profitable one.

The Association of Military Surgeons, which I will talk to you about for a moment, was formed in Chicago by a few National Guardsmen twelve years ago, General Nicholas Senn, Surgeon General of Illinois, being the prime mover of the movement. It was a small beginning, but the men who started it were large. They had, as the sailor would say, three-decker brains. This Association was first instituted for the benefit of the National Guard; later, the Army and Navy came in. Up to the time of the Spanish War the Association was fairly prosperous. During the Spanish War so many of the members went to the front that there was no meeting of the Association during 1898. In 1899 the custom of holding annual meetings was resumed, the meeting

being held in Kansas City, General Griffith, who did valiant service in the Spanish War, being president at that time. Since then, more particularly last year and thus far this year, the growth of the Association has been very rapid,—in fact, something phenomenal,—and we now number more than 1200 active and associate members. I myself am a great believer in the Association, having joined it in Washington before being connected with the militia, and my interest has not abated since that time; in fact, it has grown upon me.

There was a large representation of the Association of Military



**Brig. Gen. Robert A. Blood, M.V.M.**  
President of the Association.

Surgeons in the regular army and navy and volunteer forces during the Spanish War. General Sternberg states that more than fifty surgeons, members of the Association, were commissioned, as corps, division, and brigade surgeons. I think nearly all, if not all, of the corps surgeons were members of this Association. That they did good work goes without saying. We, as military surgeons, all know now that the criticism of the medical department in the papers and otherwise, which obtained at the breaking out of the war, were not only unjust but untrue.

The mismanagement, the cause of the criticism, was not the fault of the head of the medical department at Washington. The fault lay elsewhere. If Congress passes an act which puts the country into war without adequate preparation, of course the army, which is to fight the battles, must suffer for this want of proper preparation.

I myself believe,—and I had a fairly good opportunity to judge of the management of the medical department of the army,—

that everything was done that could have been done with the means at hand at the commencement of the war. To my mind some of the system to a certain extent was at fault. I believe with General Griffith, after his experience at Chickamauga and Lexington, part of the time as chief surgeon, that the medical department should be a distinct department, subject only to the control of the commander-in-chief, and the department should have full control of all the medical supplies, transportation and delivery of the same, and should be made responsible therefor. It was told me by good authority that many of the medical supplies that went to Cuba were in the holds of transports with all sorts of army supplies packed on top of them. They could not be gotten out promptly and the soldiers suffered in consequence of the lack of those supplies. If the supplies had been in transports controlled entirely by the medical department, they could have been landed at once on the arrival of the ship or as soon as the commanding general thought advisable and immediately transported to the front. I saw something of this at Montauk. I do not mean to criticize, but I saw the workings of the transportation system at Montauk. I saw, ninety miles from one of the largest cities in the world, sick men suffering for the want of mattresses, tent floors, etc. There was fault in the transportation of supplies and I again say that I think it was not the fault of the medical department.

If our government calls into service our young men, your sons and mine, who of course would respond promptly,—the government should be prepared to care for those young men as befits a great nation. There was some excuse in the great war of 1861-65,—with 2,500,000 men, first and last in the field,—for poor and insufficient food, clothing, medical supplies, and at times after great battles, lack of medical attention. The nation was comparatively poor, the whole wealth being estimated at \$16,000,000,000. Now, with the enormous wealth of \$90,000,000,000, and only 250,000 men called, there was no excuse in 1898 why these men should not have been furnished with a modern, up-to-date outfit. Yes, there was a reason,—Congress voted us into war before we were ready. Will this happen again? I fear so.

Were we called to put one or two million men into the field at once, the same thing would happen as when the wars of 1861 and 1898 commenced. How can this be remedied or how can the nation in a fair measure be ready?

In the first place, where would the one or two million men,—and that number is conservative,—come from? From the quota of the national guardsmen first, and then untrained men, largely in excess of all others, to fill the quota. Such a large body of men with no military training, most of them entirely ignorant of how to care for themselves, would undergo much sickness and suffering. The regular army cannot furnish trained officers for such a large force, and the more or less trained officers in the national guard would come next. It seems clear to me that in such a crisis the national guard would be a great factor, and everything that is possible should be done to put our state troops in condition for such a crisis. Bring the regular army and navy and national guard together, that the guard may profit by the knowledge to be obtained by such contact.

This Association seems to me to be one of the most practical ways of doing this, so far as the medical department is concerned. This Association should be one of the great medical societies of the world. Much medical knowledge has been obtained through the influence of this society. The good work should go on. Every medical officer in the army and navy and national guard should become a member at once. We want the regulars, for their knowledge of military and sanitary matters, and we want the national guardsmen to learn just those things. We know the medical and surgical part fairly well, but that is only a part of the business. There is a military end to it, which is very essential to know in war.

I believe that the training which the volunteer surgeon got in meeting regular army and navy surgeons through this Association was of great benefit to that service in the last war. They came to know and appreciate each other better. It is essential in a country like ours,—liable at any time to have trouble with foreign powers,—that the national guard should be as thoroughly trained and made as efficient as possible, and that the medical de-



partment in the national guard should conform to the rules that govern the regular service as far as may be. All the medical supplies, chests, papers, etc., should conform to the regular army service, so that when the volunteer medical officer is called into service, which of necessity would be the regular army, he would get on without friction with that service. Then his requisitions would be honored at once and it would be comparatively smooth sailing for him. In the Spanish War, at the commencement, our surgeons had difficulty on account of lack of knowledge of handling the regular papers, requisitions, receipts, etc. The records made by surgeons of the regular army, navy and volunteer forces have always been glorious ones. The work done by the volunteer surgeons in the War of the Rebellion was never surpassed, if ever equalled. In the War of the Rebellion, after many battles large bodies of wounded men were thrown upon the care of the surgeons. In a day at Fredericksburg more than 10,000 wounded men were to be cared for after the battle, removed to the hospitals north and elsewhere. After the battle of the Wilderness and the battle of Spottsylvania in 1864, 42,000 men sick and wounded lay in and around that little town. Think how much care those poor men needed and how little they must have got! The surgeons were worked nearly to distraction and with all that the Christian and Sanitary Commissions could do the men suffered as no one can appreciate except the ones who saw it.

In the war with Spain the stamping out of yellow fever in Cuba was enough to immortalize the names of the men who did that great work. This alone was worth the cost of the war. The glorious work of the navy is well known to all; it was all one way from Manila to Santiago. There was no chance for criticism.

I would enlarge the medical corps of the army and also the hospital corps. I also believe in trained women nurses for hospitals. No one can be as sympathetic or nearly so good a nurse to care for a sick or wounded man as a woman.

Altogether, we have reason to be proud of the work done by members of the Association during the last five years. With the enthusiasm which now prevails in the Association, I see no reason

why the work of the Association in the future should not continue to be even more brilliant than in the past, and I trust that the coming generation of medico-military men will all become members and that at no distant day this will become the most honored military society in the world. The coming meeting should be a very profitable one. The army experiences of the surgeons who are present should make their suggestions and advice very valuable, especially to the younger portion of our volunteer surgeons.

In closing these few remarks, I desire to express my pleasure at seeing so many members of the Association present. I trust you will feel while here that you are at home, and I know the citizens of Boston are interested and will see to it that you have a pleasant and agreeable visit to our city. (Great applause.)



## A PUBLIC SERVICE MEDICAL SCHOOL.\*

By LIEUTENANT COLONEL JOHN VAN. R. HOFF,

DEPUTY SURGEON GENERAL IN THE UNITED STATES ARMY; PUBLIC SERVICE MEDICAL SCHOOL COMMITTEE.

**D**URING the current year nothing definite in the direction of organizing a Public Service Medical School is known to have been accomplished.

Both the Army and Navy Medical Schools have done excellent work within the restricted limits of a five-months' course permitted them, the former having graduated a class of 38, and the latter 12 student officers.

Certainly this is a great advance beyond nothing, but is it enough?

It is observed, for example, that the service schools for the line of the Army now have a full year course, which experience has already taught is inadequate, and which it is proposed to increase to two years at the earliest practicable date. Is it possible that the young medical officer can learn in five months the special duties of his position, while the line officer requires at least two years of systematic post-graduate instruction in the service schools, with a possibility of four years additional in the War College, to study the theory of his work? Such a proposition is absurd. . . Either the medical officer is under-taught or the line officer is over-educated. And yet the latter can not be the case, or else our whole theory of military education is wrong.

Your Committee is informed that the Surgeon General of the Army, appreciating the necessity for a change from existing conditions in the Army Medical School, has submitted a scheme, of which the following is an outline:

---

\*Report of the Public Service Medical School Committee at the twelfth annual meeting of the Association of Military Surgeons of the United States.

"The scheme involves the appointment annually of say 100 Cadets of the Medical Corps.

*"Appointment.*

- (a) By competitive examination.
- (b) By appointment by State authority, subject to entrance examination.

*"Qualifications.*—"Citizens of the United States, unmarried; between the ages of . . . . . and . . . . .; physically sound and fit to discharge the arduous duties of an officer of the Medical Corps at any time and in any climate; graduates of a recognized medical college, having a degree of B.A. or its equivalent; or a thorough education in the usual branches of learning taught in High Schools; and in addition thereto acquaintance with one foreign language, classical or modern.

*"Admission.*—On being found qualified each successful candidate will be appointed and warranted as a Cadet in the Medical Corps of the Army. He will take the prescribed oath and in addition will be required to bind himself (under oath or otherwise) to serve six (6) years unless sooner discharged (and to remain single during that time unless special permission for him to marry is granted by the Secretary of War.) He will be quartered at the school, or if no proper quarters are provided will be given commutation at the rate of \$24 per month. His pay will be fixed at \$50 per month. He will furnish himself with the prescribed uniform.

*"Course of Instruction.*—Will last for one year and will consist of lectures, laboratory work, care and management of hospitals, sanitation, field work, drill and instruction of Hospital Corps, duties of medical officers, camping, marching, Army Regulations, military law, equitation, care of animals, clinical work in General Hospital attached to School, etc., etc., and generally be prescribed by the Surgeon General with the approval of the Secretary of War.

"On all the subjects of instruction and on general deportment and adaptability to service marks will be given, and monthly examinations held. Cadets failing to reach a prescribed standard will be discharged. At the end of the first six months a semi-annual examination will be held, and just preceding the end of the year another. According to their standing as fixed by their marks for the whole year they will be recommended to fill existing vacancies in the Medical Corps. Those for whom no vacancies exist will be honorably discharged with certificates of graduation."

The proposed scheme is certainly a marked advance beyond present conditions, and could be inaugurated at no increased cost to the Government, for statistics show that at present the average service under contract is barely a year, during which scarcely more than six months' effective work is done, for the physician must be gotten to and from his station, usually abroad, and must learn his business after he reaches his post of duty.

Even if the plan proposed by the Surgeon General should cost as much as the present very expensive plan—which is not likely—nevertheless, there would be an enormous gain to the service, not only in money, which, unfortunately, is too often the first consideration, but in efficiency as well, for undoubtedly contract surgeons would be taken from those students of the School who did not receive commissions. These would be well informed in their duties and obligated to serve six years.

All of the foregoing leaves out of consideration the permanent gain to the Corps, the service and the country in the development of a reliable source of supply of men thoroughly grounded in the duties of medical officers—provided, of course, that we can get the cadets. But what reason have we to assume that we will find graduates in medicine more willing or capable of becoming medical cadets than we have heretofore found them capable of becoming medical officers?

The plan is excellent as far as it goes, but it does not go far enough. It assumes that we can get all the graduates we wish to instruct, which assumption experience has not justified. *If we are to have a sufficiency of medical officers we must undertake their professional education ab initio.*

The Naval Medical School, recently transferred to Washington, is organized on the present lines of the Army School, with a course of five months.

It is presumed that the Public Health and Marine Hospital Service uses its great laboratory as a school for its officers, but of this your committee is not informed.

The public medical services aforementioned have a person-

nel aggregating at date of last available reports 1399, divided as follows:

SERVICE.	PERMANENT. (Commissioned.)	TEMPORARY. (Contract.)
Army.....	300	473
Navy.....	*345	...
P.H. & M.H.S..	110	171
Total.....	755	644

It will be observed that the temporary personnel is 46% of the total strength, and is temporary only as to the individuals composing it, not as to the number, which is not likely to be less than now, but more, and should therefore be permanent as to personnel as well. It has not been made permanent simply because it has thus far been found impossible to get a sufficient number of qualified men to fill even the permanent offices now existing, leaving out of consideration those which should be permanent but which, largely for this reason, are not.

Your committee being better informed of the experience of the Army in this direction will draw his illustrations from that source.

By reference to the Annual Report of the Surgeon General of the Army, 1902 (p. 17), it will be observed that, beginning in 1898 up to December 31, 1901, 1240 Contract Surgeons had been employed, an average of 409 per annum, with length of service averaging a little over 1 year. In addition to these, surgeons of volunteers were commissioned in varying numbers, 200 being under commission during the last two years.

The disbursements for the employment of Contract Surgeons for the above-named years is not known to your Committee. It is, however, known that for the fiscal year ending June 30, 1902, \$441,833.03 was disbursed for the pay of Contract Surgeons, leaving out of consideration mileage, etc., which, owing to the short average service of this class, adds largely to the cost.

Leaving out of consideration the excessive cost of employing this temporary personnel, the enormous loss in efficiency can not be computed.

---

\*150 added to this Corps in 1903 are to be gained at the rate of 25 per annum.

It has been said even by some military men, who should know better, that medical officers were unnecessary, as the Government could at any time hire as many doctors as might be necessary. Quite true; men can be hired to fill any position. I have no doubt there are plenty of men in civil life who consider themselves thoroughly competent to perform the duties of any position in any of the military departments, and would not hesitate to accept the office at a considerable reduction from present rates. But could they do the work? A Senator of the United States once proposed to discharge all the officers of the Army, saying he could get perfectly competent men to fill their places at \$35 per month. He was mistaken, and realized it afterwards, just as anyone who knows anything about the matter must realize that medical men without military training cannot be satisfactory medical officers until they have learned the duties pertaining to that office.

So far as your Committee knows the public medical services have never thus far been able to fill all of their permanent offices. This is an instructive fact, perhaps not so generally appreciated as it should be; and yet it is a fact. In the Army there are practically never any vacancies except in the Medical Corps, even though appointment to the Corps is absolutely on merit. The reason for this is perhaps not difficult to determine. A distinguished medical professor upon being asked by a recent graduate what he thought of the Army as a career for a medical man replied: "Oh, the Army is all right; the only trouble is they want a \$5,000 man for \$1,500."

We cannot get enough of such—the sacrifice is too great. And if we hope ever to have the public medical services adequately supplied we must educate our own men, just as are the cadets at the Military and Naval Academies educated.

From the foregoing it will be observed that your Committee is of the opinion the public medical services are now short some 700 officers, represented by vacancies and temporary employees. In addition to these the annual waste from casualties of all kinds is about 3%, or at the present basis of requirements about 42 per annum.

The demand for medical officers is not likely to be less in the future, but, on the contrary, much greater, so that we may safely base the organization of our proposed school on that of the U.S. Military Academy before the recent increase. The average number at that institution was then in the neighborhood of 300, and the average out-put about 60.

The first cost of the plant would be considerable:—a great military hospital located in Washington, capable of caring for a thousand patients and educating all classes of personnel employed in the public medical services. Such a plant might cost as much as some minor fortifications likely never to be used, but would pay for itself over and over again in pensions saved. Two millions of dollars might ultimately go into the plant. The annual cost for maintainance would be about \$300,000. The outcome would be the finest medical school in the world.

Your Committee proposes that the Medical Departments of the Army, Navy and Public Health services consolidate their schools,—pool their issues,—and make a united effort to accomplish the plan here outlined. This Association will help, and then the public will demand, after which Congress will act, and our school will become an accomplished fact.

It has been said that the three services will not work together; that there will be jealousy; fear of being over-reached, and an effort on the part of one branch or the medical services to aggrandize itself at the expense of the others. This your Committee does not fear. The proposed school will be neither an Army, nor a Navy, nor a Marine Hospital medical school, but a Public Service Medical School, independent within itself, just as the Military Academy is independent of the cavalry, the artillery, the infantry, or any other branch of the service. It will purvey to each of the services, and within the limitation of demand and supply, its graduates will select their own services.

Inasmuch as but an average of sixty will graduate, what will become of those who fall by the wayside? Most of them will complete their education at other schools, and when war comes they will take their places with the volunteers, just exactly as will those who fail to graduate at the Military Academy, and will prove invaluable, for they will know something of the duties of a



medical officer, when that something will be of inestimable value to the country, the Army, and the individual soldier.

These are the general features of the plan your Committee recommends, the details of which will not be difficult of solution.

#### DISCUSSION.

The SECRETARY: We have with us Prof. Wreden of the Imperial Military Medical School of St. Petersburg, Russia, a school which corresponds very much in its character to the school proposed by the Surgeon General, and I would suggest that it would very much interest the Association if Col. Wreden would tell us something about the Imperial Military Medical School at St. Petersburg.

COL. WREDEN, Russia: The Imperial Medical School at St. Petersburg has five years of teaching young men, who finish their schooling in gymnasiums and in some sort of a military school as a cadet corps. They are then taken to this military academy and they study here medicine as well as surgery and natural history, and in five and one-half years they pass their examinations. They then enter the army and are sent to regiments or to hospitals, depending upon how the young men have finished their studies. Those who finish among the first are allowed to choose the best vacancies and they usually go to the hospitals. Service in the hospitals is counted much better than in the regiments, because in the former the young doctors have an opportunity of continuing their studies in the specialties they have chosen; whereas in the regiments they are obliged to serve along sanitary lines and to look after the health of the soldiers rather than to be occupied in curing the soldiers of wounds or disease. In Russia all the sick soldiers are immediately sent to hospitals and are not treated in the regiments. In a regiment there are only some five or six beds in a small room where a soldier can remain during the first 24 hours until it is decided what sort of an illness he has, and then he is sent off to the hospital. So you see that the service for a young doctor in a regiment is not very advantageous for his science, whereas those who go to the hospitals at once have a chance of getting on much better.

Seven of the leading pupils of the academy every year are left at the academy for three years to afford them a chance to study their specialties; and at the end of three years three of these seven are sent abroad for two years to study medicine and surgery in foreign lands. Upon returning from abroad they are made what is called in France "professeur agrégé" and in Germany "privat docent." They have to pass a certain examination

and from these are usually chosen the professors not only for service in the military academy but for all the towns of the Empire. (Applause.)

[The remainder of this discussion immediately followed the paper on the Education of the Medical Officer, by Major William C. Borden, U.S.A. published last month, but as it applies also to this paper, it is inserted in this place.]

Surg. H. G. BEYER, U.S.N.: Without discussing this paper at length, which is unnecessary, I should nevertheless like in the beginning to state a few of my opinions on the nature and character of this school. I would be afraid that in the tendency in the beginning to make it too largely professional and scientific would probably lie a danger. Therefore I should say that in the first place, leave the entire professional part of the education of the medical man, including didactic, laboratory, and clinical instruction in the hands of the educational institutions of the country at large. It would perhaps be interfering with some of the educational institutions if we were to assume too much of the professional part of the education of the medical man. Second, the Army, Navy, and Public Health and Marine Hospital Service should not be made the means of patching up a defective professional education, which might possibly be the case under certain circumstances. The professional part of the education, in other words, had better be gotten at the well-established, first-class medical institutions of the country. Therefore, I would in the third instance confine the duties and functions of the special schools to specific instruction in those branches that are calculated to convert the doctor into the medical officer and fit him to work in the best interests of the branches of his choice and to enable him probably to do a higher class of research work, particularly in the branch which he has chosen.

Col. G. STERLING RYERSON, Canada: I had not proposed to make any remarks on this particular subject, but since the President has been so kind as to ask me to say a few words, I am willing to do so.

I think my first duty, Mr. President, is to tender you respectful congratulations upon the meeting so far as it has gone, and on behalf of the Canadian Government, which I have the honor to represent on this occasion, to tender you sincere felicitations.

The education of the medical officer is one of course which is of great interest not only from the standpoint of the regular army officer but from the standpoint of that very large body, the volunteer medical officers. As has been shown both in your own war with Spain and in the War of the Rebellion in 1861, and in

our own South African war, the bulk of the work has to be done by the civil practitioner, let him be called contract surgeon, acting assistant surgeon, civil surgeon, or what you like. And these men are in a great many instances men who have been in the militia or volunteers in some capacity. Now experience has shown that while these gentlemen are exceedingly proficient professionally, while nothing could be better than the actual professional work which they do, they fail to a great extent in relation to the administrative department. That is the weak spot in their work; and the establishment of a medical school such as has been suggested and discussed is one which ought to be of the very greatest advantage to the military men and to the medical men of this country in time of war. It seems to me, Sir, that if we in Canada had the advantage of a department so well organized and had command of the facilities possessed by the United States army, we should establish a medical school of this kind, and we would make it obligatory upon every medical officer in the militia and volunteers to take a course of instruction of not less than three weeks or one month in order to qualify him to some extent for his duties in an administrative way. It is necessary now that every medical officer shall follow a certain course of instruction. That course, unfortunately, is not as elaborate as it should be. It is necessary for him to know infantry drill up to a certain point, it is necessary for him to know ambulance work—what you call litter drill—and he must be able to pass an examination in these respects in order to get his commission confirmed. He receives his appointment, but that appointment is only provisional; he cannot be officially appointed and receive his commission until he has passed this examination to show his proficiency in these matters. But if we were in position to have such a medical school as here outlined, I would make that education very much more complete and very much more effectual than at present obtains.

I do not know that I have anything more to say on this subject, Mr. President. I thank you very much indeed for your kind reception. (Applause.)

Col. R. R. DE WREDEN, of the Russian Army: I was very happy to hear how well these medical schools are arranged here in the United States. We do not have anything of the kind in Russia. I may say that medical officers are strong in science but weak in administration. I think administration is of great value. Therefore I would be very glad to know how the schools are arranged here in order that I may show it in Russia, and we will try to have the same medical schools there that you have here in the United States. (Applause.)

Col. W. J. CHARLTON, Great Britain: Mr. President and members of the Association: I have listened to Major Borden's paper with the greatest interest, because it bears so very much on the work and the organization performed by the British medical service. I think the best thing to do in the first instance is to describe the system pursued in the English army with regard to medical officers.

The young medical officers after passing their examinations, taking their various degrees at the universities and colleges, have then to go up for competitive examination, and after being taken in by competitive examination, were sent, heretofore, to the Royal Victoria Hospital at Netley, established since the Crimean War. There they undergo instruction in various subjects, in bacteriology, general administration of military hospitals, etc., and after spending four months there they are sent up to Aldershot, where they undergo a course of instruction in stretcher and ambulance drill and equitation. As the medical officer does not know to what branch of the service he will be assigned, he is absolutely useless unless he is able to ride. That has been the system hitherto. Since the Boer War, there has been a general change. There was a regular hubbub at the time. It was said that the medical department had broken down in connection with the great epidemic of enteric fever at Bloemfontein shortly after Lord Roberts marched into the place. There were many critics going about at the time and they said the medical department had broken down. The fact is the medical department had not broken down in any sense of the word. The railways had broken down, and a thousand and one other difficulties had arisen which prevented us from working to the best advantage. But in about three weeks these matters were righted and things went on smoothly and well, and we heard no more about the medical department of the army breaking down. The army medical department is a small department, and when the war broke out the personnel was not more than sufficient to meet the demands of two army corps. As the war progressed it was found necessary to have about eight army corps, and for this reason we had to supplement our own medical service by employing civil surgeons, nurses, and orderlies from various branches. They supplemented and aided us in every possible way and they did it most efficiently. But of course the one point they were lacking in was the want of knowledge of the routine of military hospitals and the knowledge of administrative methods, inability to understand the preparation of the many official returns, documents, and things of that kind. However, taking it on the whole, matters were done very well. After this supposed break-down of the medical department there

was a great deal of agitation in England, and a commission was appointed to go out and inquire into the work of the medical service generally. This commission was presided over by the Lord Chief Justice of England and many other important civilians and men of high standing in business; and after taking an enormous amount of evidence they came to the conclusion that there was nothing whatever to justify the charge of a general breaking down of the service. However, "it's an ill wind that blows nobody good," and in this case the commission made several recommendations. One of the things to be carried out is the abolishing of the school at the Royal Victoria Hospital at Netley, and establishing instead of it a college in London, called the staff college. London is thought to be better because it offers greater opportunities to the medical officer in the way of studying and observing things than in an isolated country place like Netley. Whether that will be an advantage time only will prove. I hope it may be. But the chief thing to my mind is that they have instituted a system of post-graduate courses. Scattered as our medical officers are over all parts of the world, it is absolutely impossible that they should be able to keep themselves up in their work as well as the civil practitioner at home, who has the opportunity of being at the large hospitals and observing diseases there. However, these post-graduate courses have now been established, and every medical officer up to the rank of major and lieutenant-colonel is detailed to the large London hospitals where he must take up these post-graduate courses. I have no doubt whatever that this will add largely to the professional efficiency of the officers throughout the service,—and not alone to their efficiency, but it will inspire far greater confidence on the part of the army generally, both officers and men, in the medical officers. (Applause.)

Medical Director JOHN C. WISE, U.S.N.: Mr. President, I think there is one thing that we have to fear in the education of the medical officer, and that is by these various processes we may entirely eliminate the doctor. A medical officer must be necessarily first of all a doctor or a surgeon. In Dr. Goltra's paper that was read here last year this question of administration was very largely entered into, and some officer made the remark that his commanding officer above all wants a doctor. I think the very first element of success in the medical officer is that he should be acceptable to his commanding officer, and I deprecate very much any system of medical education which will separate the medical man, be he in the army or the navy, from the great body of the medical profession of the country. I think that receiving his education among them makes him a broader, a finer and a

better man in every way. I think the paper written by Colonel Hoff is from the most extreme military standpoint of the question. For instance, when our friend from Russia, Colonel Wreden, told us yesterday of his system, he spoke of having but a few patients at their various military stations and that if the cases proved grave they were carried to some large military hospital. Now a large military hospital is the *sine qua non* of a good military medical school, and that is what we do not have in this country. I conceive that it is impossible that our government will ever adopt a school for medical education of that kind. I cannot understand that we will have a large central hospital at Washington where this school would be located and that the naval hospital at Norfolk or Annapolis, for instance, would transmit men to Washington to become clinical material. It seems to me as rational to suppose that our medical department should be like that suggested by Colonel Hoff as it would be rational to expect that our military system should be based on that of Russia. There are two sides to this question. Col. Hoff represents the extreme military standpoint and Col. Charlton represents the other—where the medical man is educated in the large schools of the country and is given the essentials that are so necessary to his profession, and afterwards is given the details which apply to the military medical officer. That is the plan practically that we are adopting in this country, and for the present, and I do not know for how long in the future, we will have to adhere to it. To these gentlemen who advocate such extreme military medical education I would cite the example of the most distinguished military surgeon of the world—Baron Larrey. From all that I can understand, he had an ordinary medical education, was detailed at the naval school at Brest for a few months—I do not think more than six months—then went to Paris for a short time, and was soon afterwards ordered to the army of the Rhine under Beauharnais. He immediately evolved that splendid system of the flying ambulance which has become the admiration of the world, and organized the first real corps de santé for any army in the world.

Major W. C. BORDEN, U.S.A.: It was my desire to say a few words in conclusion after these expressions of opinion had been received, because I thought the discussion was much more profitable than the paper, and at the same time I wanted to get the attitude of the Association so far as possible in regard to this matter. It is a matter in which I am deeply interested. For two years I have been connected with the Army Medical School, and we are now undergoing a transition period in the school. We are attempting to modify our course of instruction to meet what we consider the demands of the

medical department of the country at large. Now I think it may be accepted, as stated in the body of my paper, that it is best in this country to have post-graduate instruction and not attempt to instruct our men in medicine and surgery from the ground up. Such a school would be too colossal, too great, too extended. When you come to think about educating a man for medicine at the present day you have to think of the large hospitals with their clinical advantages and special instruction of all sorts. I do not think that practical, nor do I think that Congress would appropriate sufficient money to establish a large school of this character.

That the medical officer should be a physician and surgeon, and a good physician and surgeon, goes without saying. That is the first and most necessary qualification of the medical officer. In fact, I stated in the body of this paper that all the ends and aims of the medical department of the army were first to care for the sick and wounded, and second, to maintain the health of the army, and that all the administrative details of every character, kind, and description are means to this end. Now, there are certain men who magnify the means beyond the end. They think the value of drill and instruction in administrative work is so great that it overshadows all other lines. All these means must be directed to the care of the sick and the preservation of the health of the army. All our methods of procuring clothing, medicines, etc.,—everything of the red-tape, so called—is only that we can do these things properly, only that we can care for the sick properly and maintain the health of the army. The whole red-tape business comes right down to that and nothing else. We are met in this country with certain peculiar conditions, very similar in many respects to those to which the representative from Canada called attention. We have to depend on the volunteer service more largely than the regular force in time of war. All of us, as our President suggested in his annual address this year, are cognizant of the fact that while the doctors who come from the volunteer service in time of war make most excellent professional men they fail from the administrative standpoint. In other words, they are not able to accomplish the two chief ends which should be accomplished—they are not able to properly care for the sick and to maintain the health of the army, because they are not familiar with the red-tape methods by which these ends are accomplished. That is the whole point. We are attempting in our army medical school to correct exactly this point. This army medical school was started largely as a professional

school. Its course consisted almost entirely of instruction in clinical microscopy, bacteriology, and sanitary chemistry, taking men who were already fairly adequately trained to perform their duties as professional men. But we now recognize that the army medical school should train more largely along entirely different lines, and that is along the administrative lines by which the ends for which the medical department is organized may be carried out. In other words, instead of training exclusively in bacteriology, clinical microscopy, and sanitary chemistry, we now wish to train in the administrative methods by which the men may be properly prepared to perform their military functions. Now if in addition to this we can bring the officers of the National Guard to this school and train them in all the methods by which they may shelter, clothe, feed, pay, and take care of their patients and the members of the Hospital Corps, when they go into war they will not only be good professional men but they will be good administrative men as well. As Col. Charlton states in speaking of the South African war, the failure was in no sense of the word a professional failure but was due to the fact that the great bulk of the men called into service did not know the routine of administration. Now an army medical school should cover these points, and I simply called attention in my paper to the steps that have been taken by Congress and by the Secretary of War and by the administrative branches of the government to further this end. I sincerely hope that the plan may meet with the approbation of the National Guard of the United States, as it has seemed to me that thereby the entire service should be greatly benefited. (Applause.)

Major AZEL AMES, U.S.V.: I should like to say a word on this subject because it is one that lies very near my heart. With an experience in the medical department of two wars, I am not likely to be one to undervalue the worth of administrative knowledge, and no one knows better than the author of this paper how warmly I am interested in the medical officer's work. I do not, however, quite agree with him that there has been the measure of break-down in the medical service which he states, when we have large forces suddenly called into war, because of the non-acquaintance of the volunteer medical staff with the peculiar paper work and administrative forms of the army, for I have not found it so—in fact, in my observation over a pretty wide field the volunteer contingent of medical officers has not been very far behind their brethren in the regular service in the percentage of average



success in administrative work. Of course, as the old farmer expressed it, "there is more in the man than in the land," and all the training in the world will not make an excellent administrative officer out of a man if the elemental qualities are not there.

I was once very much interested in the work at Netley, was well acquainted with Prof. Parkes, and enjoyed largely his friendship and the observation which it permitted at his school. No one has a higher estimation of what that has done for the British service, but I think it is fair to point out that that is a standing army with a large permanent medical corps. The initial point of difficulty is that in a republic there is always hostility to a large army, always hostility to an extensive medical staff corps or any other staff corps. It is not likely that we shall ever receive from Congress that measure of support which will make possible the realization of our ideals. I thoroughly agree with Dr. Wise in his expression in regard to the necessity of primary work in medical training being done at the great centers of learning. Then it comes down to the question of administrative work and Major Borden has told us of what is contemplated by the army medical school to facilitate the training of our medical officer along administrative lines. But what are the actual, practical facts as they appear to one familiar with the details that must be followed? You have your regular army contingent, and no man will join with the friends of this measure more cordially than myself in any way possible in trying to make that a post-graduate course of the best sort so far as the regular force is concerned. You cannot do too much to make your permanent medical officer all that he ought to be along those lines. But now let us see what its value is—if it is going to reach out and include the whole army when that army comes as a fresh contingent into the field; its value must exist in its relation to the new man who comes in from the country, and of course we all agree it is admirable that he should know administrative methods. But how are you going to do it? The first provision is that of making the facilities of the army medical school available to the officers of the National Guard. Right here, it seems to me, is where as Uncle Remus says you "break the molasses jug." I cannot see but that this is where you break down. I know of no way by which you are going to be able to take any considerable number of medical officers from the National Guard, send them to Washington at considerable expense, and train them as it has been pointed out they should be trained in these administrative features. Now,

how are you going to do it? As a practical matter, I fail to see how it is going to be done in this country. We have a Congress jealous always of any large establishment, we have a people behind that Congress even more jealous. They know that we have in successive wars relied upon the medical profession of the country for medical work and that in the main it has been good work. But tell me how is the average doctor of the National Guard, with his regimental and staff work, going to spare the time to go to Washington, and how is he going to be supported and paid, and when you have got him trained what are you going to pay him then, and how? I have served with and I thoroughly appreciate my friend, Col. Hoff, and his efforts along these lines. It has been said here that his views are extreme. They are absolutely impracticable, because even as a post-graduate course it would be almost impossible to take a young man and ask him to refrain from marrying for so many years and accept the small stipend the government can pay him. I think I know the American people and their tendency, and I have no hesitancy in saying that it is impracticable. I do not say the thing is impossible, but I look for a more definite suggestion than has yet been offered as to just how, practically, the medical officers of the National Guard are to be brought under these helpful influences, which we all desire, before I can say a cordial amen to it.

Lieut. Col. CHARLES C. FOSTER, M.V.M.: I think there is still another point of view in this matter, impressed upon me very strongly in 1898. We went out to Framingham and spent the whole summer there with a regiment of 1300 men. During all that time I never got from the government a word of instructions or suggestion of any kind. It was all blind to me. I said to myself, now what does the government want me to do; what does it expect me to have to work with either in materials or men?" So far as materials went, you, Mr. President, offered me anything I wanted. All I had to do was to ask you for it and I got it. If it had not been for that I do not know just where I should have come out. But it seemed to me some authoritative pamphlet describing the duties of the new medical officer would be of great value. This it seems to me should outline the work of the medical officer in his regiment, brigade, or division. It should state what the organization of a regimental, brigade or division hospital should be, as to personnel, duties, and materials, and one such pamphlet should be issued to every National Guard medical officer, and one should be issued to every volunteer medical

officer with his commission. It seems to me that would have saved a great deal of trouble and a great many mistakes. I do not see why this Association should not consider that question and lay out a scheme for such a pamphlet. As I say, it was blind to me, and it must have been a great deal blinder to a great many men who had no previous experience and who did not have a well organized local surgeon general's office to fall back upon.

Brig. Gen. E. C. BRUSH, Ohio: This discussion has been very interesting to all of us, and especially those of us from the National Guard. The establishment of a post-graduate school at Washington or the development of the one already established, means a great deal to the National Guard. I do not believe it is practical for this school to be open to officers of the National Guard and for the government to pay them while attending. I think that the whole thing has got to be brought down to a practical business basis. The compliance with the recent acts revolutionizing or reorganizing the militia is going to put the medical officers of the State troops on a very different basis. For instance, in Ohio our medical officers, with the exception of the chief, are now appointed for life. It is bringing a new element into that medical department; it is bringing in the best of the young physicians of Ohio, and I have no doubt that other States are ahead of us in this respect. If at Washington there is a post-graduate medical school with enough of the military about it to perfect these young men who are entering the National Guard under the new act in the military part of their duties, these young men will be glad to go to that school at their own expense so far as their living and keeping are concerned, the government giving them their tuition free. Today every progressive young man in the profession is not away from his original school more than five years before he is back somewhere to a first-class post-graduate school—and some of us who are older go back. Now a good post-graduate school at Washington to which these young men from the National Guard can go for a post-graduate course, will be an incentive to good young men to come into the military service of the States, because they will know that if they come into that service, under proper restrictions they can go on to Washington and take a post-graduate course. I think that what we need is a happy medium between the administrative and the medical part of this whole thing.

Lieut Col. N. S. JARVIS, New York: I have listened with a great deal of interest to this discussion. Having been in

the regular service and now being an officer of the National Guard, I can sympathize with both sides of the question, and I think I am in a very favorable position to consider it from both standpoints. Now in my busy city of New York it cannot be expected that doctors who make their living by the practice of their profession can devote any great amount of time to the study of military administration or military medicine, so-called. The medical man in the national guard is an entirely different personage from the line officer. The line officer when his work is done at his office can go to the armory at night and there is an end of it. It is not so with the doctor. The doctor goes to the armory, but no sooner does he get there than he is sent for to attend a patient, and if he does not go he perhaps loses his patient and certainly a fee besides. Now that means considerable deprivation to a doctor, and particularly a young doctor, and most of the national guard doctors are in the younger period of life. If we could only persuade the "powers that be" that the medical man makes a great sacrifice when he goes into the national guard, they might be induced after a while to make it an object for a good man to go into the guard and devote a great deal more time to it than at present. It is my belief that the medical men in all the regiments should be paid for a certain length of time. For instance, in some regiments in New York City the medical officers are required to be at the armory two nights a week, and I presume this applies to other national guard organizations. To the general practitioner this means a great loss of money. I think the State authorities should provide for the pay of the surgeons of the organizations when they devote more than one night or day in the week to their national guard duties. Now how can we expect a national guard officer to give up his practice—that upon which his family depend for a living—in order to learn all these duties of administration? Of course it would be a very nice thing if he could learn them, but time is money to the doctor. I merely mention this one fact because I have talked it over a great deal with medical officers.

Another thing about administration: There are three classes of men in the medical profession. There is the man who is a splendid doctor, who keeps well posted in his profession, and who is a splendid administrative officer, who is alert to everything for the benefit of his men and the administration of his hospital. Then there is the splendid doctor and miserable administrator, who does not seem to have the faculty of administering his hospital. Third, there is the

poor doctor and the poor administrator. We do not have any of that class in this Association, I am glad to say (Laughter and applause).

Now as to the sending of the medical officer to the government medical school in Washington in order to learn his duties. This would be a very beautiful thing if somebody paid for it out of his own pocket. We gentlemen can I think force our states to do that if we will. If the State would designate a certain number of medical officers to go to Washington and learn administrative duties, they in turn could teach these duties to the other officers of their States. But that must be done at the expense of the State, and my experience is that New York State will hold on to its dollars with the utmost tenacity before it will let doctors have them. It takes me six months to get three or four dollars as a member of a board. The fact of the matter is that we doctors are not politicians. Perhaps it is a good thing we are not, but we have got to be if we want to benefit the medical department along the lines which Major Borden has laid down.

Major W. C. BORDEN: I would like to ask Col. Jarvis if he does not understand that the act of Congress allows travel allowances, quarters, and pay for these men who go to the medical school? They get the same travel allowances that officers of the regular army get and they get commutation of quarters according to their rank.

Lieut. Col. N. S. JARVIS: That is in the case of those States, Major, that have complied with the bill. There are lots of States that have not yet complied with it.

Major W. C. BORDEN: I think they will comply with it.

Lieut. Col. N. S. JARVIS: I tell you frankly, gentlemen, that you need not include New York State as one of those complying with it. It is going to be a very serious question whether New York State will comply with it or not, from what I have heard. I do not say that New York State is right. Those States which have not complied with it should provide for the traveling expenses, etc., of the medical officers assigned to duty for instruction at the school in Washington.

Major GUY CARLETON JONES, Canada: I think my experience may perhaps be of some value in this connection. Under the very able guidance of the Director-General, the Canadian medical service, which was previously a purely regimental one, was reorganized and a medical staff established. Some few officers were sent to England and took a course of training, partly at Netley but chiefly at Aldershot, in the administrative part of the medical service. The object of send-

ing us was that we should return to Canada and impart the knowledge that we were supposed to have gained to the medical officers who had not been sent. When we returned to Canada, classes of instruction were formed by the officers who had been to England. At these camps of instruction all medical officers had to attend; all medical officers who had not qualified had to qualify, and as Col. Ryerson has stated all medical officers in the future had to qualify before they got their commissions. These courses were held at the camps of instruction and they were very short of course, but I think they did a great deal of good. They trained the officers of the militia up to a certain point, and our officers of the militia are practically the same as your officers of the national guard. There was a great deal of opposition to this among some of the older medical officers who had been attending camps for a number of years and had never done anything of this kind. They looked upon the period of 12 days as one of jollification. I was a very junior officer at that time, and I remember that at the first camp I struck I felt somewhat nervous in conducting a course of instruction for officers, the majority of whom were very much senior to me. There was a little rebellion at the start, but they soon settled down. One medical officer was also a member of parliament and objected very strongly to carrying around a litter to pick up patients. He was somewhat elderly and very corpulent (laughter); but in two or three days training he was the most enthusiastic member of the class and he felt extremely hurt if he was not carrying two or three men around in litters all the time (laughter). He was going to retire, but since then he has asked to be continued and has become the most enthusiastic member of the medical service in Canada.

When we organized the medical field hospital to go to South Africa, with the exception of myself none of the officers had had any training in administration. But the officers, and medical men especially, learn very easily. They are used to learning; they have been learning all their lives, and they very quickly picked up the administrative details of a system which, with all due apology to Col. Charlton, is the most cumbersome military system one could possibly run up against. (Laughter). But it was not with the officers that we had trouble. It was the idea that we should take medical students as much as possible and we had a great many qualified men in the ranks. Out of a personnel of a field hospital of 58 we had as many as 12 qualified men. It was there that we had the trouble, and I think it is almost more important that

the non-commissioned officers—and I do not see much provision in Major Borden's scheme for the training of the non-commissioned officers of the national guard—should be trained in administrative work than for the commissioned officers. So when we got to South Africa we had to ask for a non-commissioned officer of the royal army medical corps to take charge of our returns, because we found our non-commissioned officers were not equal to it. We had a few trained non-commissioned officers in Canada, but they were kept in Canada for the purpose of giving instruction at the camp of instruction.

Lieut. Col. J. K. WEAVER, Penna.: As representing Pennsylvania, I desire to say a word. The medical officers of the National Guard of Pennsylvania are men in general practice. They are selected because of their qualifications as medical men. They must have been in practice for four years; they must be graduates of some reputable medical school; they must be members of the county medical society; they must be endorsed by the secretary of that society. Therefore their qualifications as to character and ability from the medical and surgical standpoint are first class. I had the honor to serve in the last war and have had some experience in military duties, being brigade surgeon and in charge of a division hospital almost all the time that I was out, and ran up against a good deal of this administrative difficulty. The conclusion to which I arrived was this—that it was not so much the fault of the national guard medical officer as it was the fault of the government in not giving to those medical officers proper instruction. It was taken for granted that the medical officer of the Guard was competent to discharge his administrative duties. Of course we have our administration in Pennsylvania, but it is not nearly so thorough and complicated as that of the regular army. My impression is that if the government had taken pains to personally instruct the medical officers of the Guard they would not have had any difficulty, because our surgeons are practical men, they are in active daily life, they are business men, they manage their own affairs, and it is presumed that they are competent to manage the administration of a regiment or of a hospital. My belief is that it would be a great deal better for the government at Washington to take the suggestion of Colonel Foster and put into the hands of the medical officers of all the States such data and literature upon the subject of administration as would be necessary; and I am very sure that we would be competent to discharge our duties as administrative

officers if we should go out into another war. I do not think that the government can use the medical officers of the Guard as it is proposed to do, by having them go to Washington and take up a course of administrative training. I do not believe that is practicable. We are of course all intelligent men in the National Guard, and I am sure we can pick up this matter of administrative work very quickly, and we will do it very cheerfully. Our schools in Pennsylvania are good schools. No man who comes from those colleges but is competent medically and surgically. He must pass an examination before the State board of medical examiners. He must pursue a four years course and the standard of medical examination is such now that a man must be a graduate of a high school to be admitted to some of our colleges. And so I do not think that we need at Washington a school for the training of national guard medical officers. I would suggest, however, that the War Department at Washington send out such administrative literature as is necessary to put into practical use in time of war, and I will guarantee that the Pennsylvania medical officers will fill the bill.

Medical Inspector F. B. STEPHENSON, U.S.N.: During a recent sojourn in Washington, D. C., I received a very courteous welcome from scientific and professional colleagues on duty in connection with the Army Medical School, the Navy Medical School, Department of Public Health and Marine Hospital Service, and the Agricultural Department. To the casual observer it seems that the special scientific work could be done under control of one bureau; and that the special bacteriologic instruction for medical officers could be obtained under the direction of one company of scientists permanently acting. The hygienic knowledge and duties peculiar to the various departments, as regards the medical officer, could be given by officers experienced therein through actual service in the field or afloat. Such systematic centralization promises economy of mind and means, with, perhaps, better result.



# Medico-Military Index.

## MEDICO-MILITARY ADMINISTRATION.

**Villa (E.)** Gli ospedali trasportabili Döher. *Gior. d. r. Soc., ital. d'ig.*, Milano, 1902, xxiv, 251-259.

**Weber (H.)** [Care of men by "first aid sisters" in peace and in war.] *Rothe Kreuz*, Berl., 1902, xx, 438; 462.

## MILITARY HYGIENE.

**Appel (D. M.)** The Army Hospital and Sanatorium for the treatment of pulmonary tuberculosis, at Fort Bayard, New Mexico. *J. Am. M. Asso.*, Chicago, 1902, xxxix, 1373-1379.

**von Bruns.** Das erste Verband auf dem Schlachtfelde. *Arch. f. Klin. Chir.*, Berl., 1902, lxvii, 693-700.

**Canney (H. E. L.)** The prevention of typhoid fever in armies. *Lancet*, Lond., 1902, ii, 1742-1746

**del Castillo (L.)** La guerra del Paraguay; condición física y moral del soldado argentino en esa época (1865); enfermedades reinantes en el ejército de operaciones. *An. san. mil.*, Buenos Aires, 1902, iv, 1; 132; 225.

**Hausman (F.)** [New data for determining aptitude for military service.] *Voyenno-Med. J.*, St. Petersburg., 1902, lxxx, med.-spec. pt., 2534-2543.

**Hawkins (G. T.)** Was he a malingerer? *Australas. M. Gaz.*, Sydney, 1902, xxi, 572.

**Huble.** [The bag for soiled linen in military barracks.] *Bull. mtd.*, Par., 1903, xvii, 17.

**Ivanoff (N.)** [Sterility of meat conserves adopted by our army]. *Voyenno-med. J.*, St. Petersburg., 1902, lxxx, med. spec. pt., 2761-2792.

**Kharitonoff (L. A.)** [Asbestos filter for field duty]. *Voyenno-med. J.*, St. Petersburg., 1902, lxxx, med.-spec. pt., 2818-2821.

**Kos (M.)** [Visual defects in men capable of bearing arms.] *Wien. med. Wchnschr.*, 1902, lii, 162; 184.

**Krasnopilevtsch.** [Influence of trachoma on shooting]. *Voyenno-med. J.*, St. Petersburg., 1902, lxxx, med.-spec. pt., 2580-2582.

**Krocker.** [The clothing and equipment of the soldier.] *Arch. de mtd. et pharm. mil.*, Par., 1902, xl, 505-514.

**Kunow.** [A simple system of graduated lenses for the business of mustering and recruiting troops.] *Militaerarzt*, Wien, 1903, xxxvii, 37.

**de Lavarenne (E.)** [Tuberculosis and the army.] *Presse mtd.*, Par., 1902, ii, 1177.

**Lemoine (G. H.)** [Relation of the development of phthisis in the army to familial phthisis or phthisis previously acquired.] *Arch. de méd. et pharm. mil.*, Par., 1903, xli, 97-109.

**Lowenthal (V.)** [The sanitary condition of the army and the Parliament.] *Rev. scient.*, Par., 1903, 4. s. xix, 172-177.

**Mahn (G.)** [Diseases of the ears and aptitude for military service.] *Presse méd.*, Par., 1903, i, 208.

**Makarov (N. V.)** [Suicides in the Russian army.] *Voyenno-méd. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 2203-2239.

**Noel.** [The mortality of the French army.] *Bull. méd.*, Par., 1902, xvi, 1013; 1023; 1037; 1049.

**Noel.** [The sanitary condition of the army considered before the Senate.] *Bull. méd.* Par., 1903, xvii, 233; 244; 255.

**Ost.** [The new military insurance law.] *Cor.-Bl. f. schweiz. Aerzte*, Basel, 1902, xxxii, 698-700.

**Pfalz.** [Views as to prescribing spectacles for soldiers.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 112-118.

**Poore (G. V.)** Colonial and camp sanitation. 8°. London, 1903.

**Potapoff (I. M.)** [On the diagnosis of feigned gonorrhœa.] *Voyenno-méd. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 2997-3000.

**Reille (P.)** [Mortality in the army.] *Ann. d. hyg.*, Par. 1903, xlix, 132-157.

**Schmidt (G.)** Effect of the height of the barracks upon the bodily development of troops.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 141-148.

**Schmidt (G.)** [Military service and bodily weight.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 65-91.

**Shepilevski (E. A.)** Cause of malaria in Termeza, Turkestan military circuit. *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 2025-2059.

**Sickinger (A.)** [On the need of dental hygiene in the army.] *Wien. zahnärztl. Monatschr.*, 1902, iv. 494-507.

**Taylor (Sir W.)** An address on the medical profession in relation to the army. *J. State M.*, Lond., 1902, x, 672-685.

**Tobold.** [Appendicitis in its relation to aptitude for military service in the German army.] *Caducée*, Par., 1903, iii, No. 4, annexes.

**Timofeyeff (P. V.)** [Acuity of vision and refraction of the eyes of the corps of cadets of the Don.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med. spec. pt., 68-94.

## MILITARY SURGERY.

**Aczel (K.)** [Rendering first aid.] *Gyógyászati*, Budapest, 1902, xlii, 372-376.

**Bleicher (P.)** [Interesting cases of syphilis in soldiers.] *Militärarzt*, Wien, 1902, xxxvi, 168-170.

**Foxworthy (F. W.)** Modern war wounds. *Tr. Indiana M. Soc.*, Indianap., 1902, 302-320.

**Hariot (P.)** Les fleches et les armes empoisonnées. *Nature*, Par., 1901-2, xxx, pt. 2, 34.

**Korsch.** [How can bandaging materials be rendered fit for further use.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1902, xxxi, 616.

**Krause (F.)** [Sling arrangements for weapons of impulsion.] *Internat. Arch. f. Ethnag.*, Leiden, 1902, xv, 121-155, 7 pl.

**Nancrede (C. B.)** The results of wounds of the large joints by modern military projectiles. *Tr. Am. Surg. Ass.*, Phila., 1902, xx, 18-27. [Discussion], 39-53.

**Ogston (A.)** Remarks on the influence of Lister upon military surgery. *Brit. M. J.*, Lond., xxiii, 1837.

**Slick.** [The wounds sustained by the German detachment of Admiral Seymour's expedition.] *Arch. d. méd. nav.*, Par., 1903, lxxix, 64-66.

**Tiffany (L. M.)** The great importance of drainage in bullet wounds of intraperitoneal viscera. *Tr. Am. Surg. Ass.*, Phila., 1902, xx, 13-17. [Discussion], 39-53.

**Zamuravkin (K. I.)** [Wounds with jacketed bullets after contemporary data, with illustration of two cases of gun-shot wounds.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 4073-4096.

## MILITARY MEDICINE.

**Craig (C. F.)** Malta fever; its occurrence in the United States Army, with a review of the literature. *Am. J. M. Sc.*, Phila., 1903, cxxv, 105-115.

**Elliot (A.)** Typhoid fever in South Africa. *Tr. M. Soc.*, Lond., 1901-2, xxv, 21-40.

**Filoff (A. G.)** [Brief report of the course of malarial fever in the patients of the Kushkin garrison, who were treated in the Samarcand military hospital.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 4231-4279, 1 pl. 1 tal.

**Finkelshtein (Y.)** [Typhoid fever in the Tashkent garrison.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med.-spec. pt., 1612; 2006.

**Houtave.** [An epidemic of typhoid in the barrack at Bruges.] *Arch. méd. belges*, Brux., 1902, 4 s., xx, 361-370.

**Lowenthal (V.)** [Tuberculosis in the French army.] *Rev. de la tuberculose*, Par., 1902, ix, 365-423.

**Mabry (W. C.) & Gemmill (H. C.)** Cholera aboard the United States Transport Sherman: experiences of the army surgeons in charge of the cholera cases, suspects and contacts disembarked in Japan for quarantine; description of the new Japanese antitoxin and cholera vaccine. *J. Am. M. Ass.*, Chicago, 1902, xxxix, 1592-1597.

**Maubach (H.)** Zur Neuregelung des Militär-apothekerwesens. *Pharm. Ztg.*, Berl., 1902, xlvii, 486.

## Editorial Department.

### FEATURES OF THE BOSTON MEETING.



**N**EVER has the hospitality which the good people of the Hub displayed to the Military Surgeons been surpassed in the history of the Association. The scientific work of the twelfth annual meeting, as may be seen from the minutes of the meeting, published in this number of the JOURNAL, was ample in amount and of the customary high quality, but in addition to this feast of reason, Boston had prepared a more material entertainment of the most lavish description.

The Association was most fortunate in its choice of headquarters. The Lenox is not only a beautiful hotel, but thoroughly well managed and most centrally located in the choicest portion of the famous Back Bay District. Facing the Harvard Medical School and the Athletic Club, it was but a block from the railway station. But a block in another direction was Copley Square, the Public Library, the Academy of Fine Arts, the Massachusetts Institute of Technology, the new Old South and Trinity Churches, and only a step further led to the Public Gardens. The meals were served in the handsome Palm Room and all through the meeting the lobby was enlivened by the flash of picturesque uniforms and the gay toilettes of the visiting ladies.

The entertainment opened up with the reception given by the Ancient and Honorable Artillery at their armory after the opening session of the Association. This organization's

reputation for hospitality was fully sustained by the cordial greeting extended to its guests.

The reception of General and Mrs. Blood at the First Corps Cadets Armory was a gorgeous affair. General and Mrs. Blood were supported by Governor and Mrs. Bates, the Governor's entire military staff, and the



**The Hotel Lenox.**

foreign delegates to the meeting. The armory was a blaze of brilliant color, and music by the fine band of the Cadets added to the interest of the occasion.

The luncheon given Wednesday by Col. Henry O. Marcy at his charming home on Commonwealth Ave. was one of the most agreeable social features of the meeting. The happy manner of the host and the unstinted generosity of his entertainment had a clear field. The ladies accompanying the



**The Palm Room at the Lenox.**

members were being delightfully entertained at the same time at the historic mansion of Mrs. Samuel Eliot, and in the afternoon they were the guests of honor at a reception given by the New England Women's Press Association. In the evening both sexes were guests at a review and evening parade by the First Regiment Heavy Artillery, M.V.M. at its armory, followed by the presentation of long-service medals by the Lieutenant Governor of the Commonwealth, and closing with finely executed exhibition drill of the Massachusetts Ambu-



**The Start of the Automobile Excursion.**

lance Corps under command of Captain Robert E. Bell, M.V.M.

The scientific work of the Association closed at noon on Thursday and the afternoon was devoted to sightseeing under the care of the Massachusetts Automobile Club, whose members combined the functions of cicerone and chauffeur for the occasion. The beautifully picturesque route from Boston to Lexington and Concord presented its most attractive aspect.

the homes of Emerson, Hawthorne, Longfellow, Thoreau and Alcott deepened the interest of the trip; the classic shades of Harvard added to the glamour of the visit; and the storied battlefields of Concord and Lexington were a fitting culmination to the day. While the members of the Association were being carried in this manner through these memorable scenes, the ladies were being similarly escorted by special electric car, and the two parties joined forces in the Colonial Inn at Concord where refreshments were served. The Minute Man at Lexington, the old north bridge with its granite memorial



**A Group of Officers and Ladies at the Twelfth Annual Meeting.**

to the patriots who fell at Concord, the ancient Hancock-Clark homestead now dedicated to the display of revolutionary relics, and the ever recurring series of reminders of famous men and incidents tended to create an occasion of the profoundest interest. After the return to Boston, the Association was the guest of the Tavern Club at a superb musicale.

A large number of the Association remained over another day to still further enjoy the entertainment provided by the committee of arrangements. The morning was devoted to a

tour of Boston Harbor on the U.S. Army quartermasters' steamer, *Henry Wilson*. General Adna R. Chaffer, U.S.A., commanding the Department of the East, accompanied the party as far as Fort Warren, where he disembarked to make an official inspection of that post. After an hour passed in examing the works at Fort Warren the steamer was again boarded, and the party returned to Boston.

In the afternoon, members were given a choice of two trips, one to Plymouth Rock and one to Old Boston. A party of twelve elected to visit Plymouth and were there met by members of the Standish Guards and escorted about the place, none of the points of historical interest being missed in the pilgrimage.



The remaining and by far the larger portion of the party devoted themselves to the exploration of old Boston under the guidance of Captain Myles Standish, Colonel Marion and Lieutenant Gibson. With the assistance of a special trolley car Old South and Old North Churches were visited, Copp's Hill was surmounted, the old Constitution was boarded, the Charlestown Navy Yard was invaded and Bunker Hill was scaled,—the day closing with a delightful reception at the beautiful home of General Blood only a few steps

**Badge of the Boston Meeting.** from the great obelisk which commemorates the birth of American liberty.

Thus closed the functions attending what proved to be in many respects the most memorable meeting the Association has ever held. For lavish hospitality individually and collectively, for historic interest of intrinsic value and splendid demonstration, for general good feeling and harmonious movement, in addition to excellent scientific work, it has never been surpassed.



## THE OFFICERS OF THE ASSOCIATION.

1903-1904.

THE Association acted with its customary conservatism and judgment in the selection of its officers for the coming Association Year. The presidency and first vice presidency were settled before the nominating committee was appointed, and it took but a few moments for the unanimous voice of approval to utter the names of the candidates for the second and third vice presidency, while there never was a question for a moment with regard to the treasurership.

Medical Director JOHN CROPPER WISE of the Medical Corps of the United States Navy, who was elected to the presidency, was born in Accomaco County, Virginia, in the 7th of October, 1848, and christened with the name of his father. His preparatory education was received at the University Preparatory School and his professional training at the Medical Department of the University of Virginia in 1867-68 and at Washington University in Baltimore in 1868-69. Upon his graduation he became an interne and soon thereafter resident physician and adjunct professor of medical jurisprudence at his alma mater.

He was one of the first of the sympathizers with the Confederacy to accept the fact of a reunited nation and to enter its service. In 1870, he passed the naval examining board and on the 28th of April of that year was appointed an assistant surgeon, being promoted in regular succession to be passed assistant surgeon in 1873, surgeon in 1882, medical inspector in 1896, and attained the grade of medical director with the rank of captain in the navy (colonel in the army) on the 7th of February, 1900. During this period he has seen fourteen years and six months of sea service in most of the waters of the globe. Since 1897 he has been on examining and retiring board duty in Washington.

While serving on the "Dispatch" at Constantinople in 1888-89, it was his good fortune to witness the operations of the Turkish army in the field and he embodied his observations in a valuable report, "Turkish Hospitals and Means of

Transportation of Sick and Wounded in the Turkish Army during the late War." During the same cruise he made a careful study of bubonic plague upon which in 1877 he made an interesting and scholarly report. In 1891, while with the "Alliance" at Chemulpro, Corea, on the Asiatic Station, he had charge of the sick during an epidemic of small pox, and established a small pox hospital. In 1898 he was fleet surgeon of the Pacific Station during the war with Spain, and the portrait accompanying this sketch was taken upon his return from that duty.

He has been an active contributor to professional literature, having published memoirs upon: "Erysipelas—its History and Treatment," in 1877; "Acute Meningitis with Cases," and "Concussio Cerebri," in 1883; "The Plague," Constantinople, 1877; "Elephantiasis" and "Scorbutus in Young Infants" in 1895; "Cooperation in Public Sanitation," in 1896. In medico-military literature he is also well represented by papers upon, "The Naval Medical Officer and Expeditionary Boat Duty," "Method of Transporting Wounded on Ships of War," "The Medical Department on our Ships of War," "The Health and Efficiency of Naval Apprentices," "Climatology and Diseases of Hawaii and of the Philippines," "The Naval Medical Department." He was an official delegate from the Navy Department at the Columbus, Washington and Boston meetings of the Association and presented at those meetings respectively, papers on "Medical Organization on Shipboard," "Education of Medical Officers for the Public Service," and "Service Conditions, Pensions and Retirements."

He is a member of the Society of the Sons of the Revolution and of the Maryland Academy of Natural Sciences; of the Virginia and the Newport Medical Societies, and the Virginia Historical Society. When the Association of Military Surgeons enlarged its bounds to include the regular services in 1894, he promptly availed himself of the opportunity and thenceforth continued to be an enthusiastic member. In 1887, he was elected second vice president, in 1900 and 1902 he was made first vice president, and in 1903 was chosen president,



**Medical Director John Cropper Wise, United States Navy.  
President.—1903-1904.**

being the second naval medical officer to occupy the position in the history of the Association.



Surgeon General WALTER WYMAN of the Public Health and Marine Hospital Service was the subject of a full biographical sketch in the JOURNAL for December, 1902. He was then second vice president of the Association and his advancement to the first vice presidency was a cordial recognition of his great services to the cause of public health and his active interest in the work of the Association. He

**Surg.Gen. Walter Wyman, P.H. & M.H.S.**  
**First Vice President.**

has been greatly interested in the Association,—an interest which has widely extended throughout his corps, nearly a hundred of whom have become members during the last half year.

Major ALBERT HENRY BRIGGS of the National Guard of New York was a charter member of the Association and has from the beginning been

one of the most active and efficient members. He has been a medical officer of the sixty-fifth regiment of the National



**Major Albert H. Briggs, N.G.N.Y.**  
**Second Vice President.**

Guard of New York for twenty four years, twenty years of the time as Major and Surgeon, accompanying it into the field when in 1898 it served during the Spanish American War as the 65th Regiment of New York Volunteer Infantry. He has served the Association as Committee on Transportation for ten years and as Chairman of the Committee of Arrangements for two meetings. Whatever Major Briggs undertakes to do, he does well and the office of second vice president will be thoroughly well filled during his incumbency.

Brigadier General ROBERT MAITLAND O'REILLY, Surgeon General of the United States Army was the subject of a cordially appreciative biographical sketch in the JOURNAL for September, 1902, by Captain John Stewart Kulp, upon the occasion of his becoming chief of the medical bureau of the War Department. General O'Reilly has already been able to accomplish much for the service by the reorganization of the Hospital Corps and in numerous other directions and has been a steadfast friend of the Association, which has been glad to show him honor by making him one of its vice presidents.



General Robert M. O'Reilly U.S.A.  
Third Vice President.

The Executive Council remains nearly the same as the Executive Committee of last year, Major Jefferson R. Kean succeeding, as an appointive member, to General O'Reilly who becomes a member ex-officio, and Surgeon J. M. Gassaway representing at once the Public Health and Marine Hospital Service and the City of St. Louis where he commands the United States Marine Hospital. The personnel of the Executive Council as now constituted is a strong and experi-

enced one, and it will be sure to conduct the affairs of the Association in an enterprising and conservative manner.

Some reference was made to the Secretary Major JAMES EVELYN PILCHER and to the Treasurer Major HERBERT ALONZO ARNOLD in the JOURNAL for July, 1902 in connection with the officers for last year. Some of the Secretary's work has since been in the hands of the Association each month in the shape of the JOURNAL while a part of the Treasurer's work has equally reached each member during the year in the shape of a reminder of the needs of his office. Both of these officers



**Major James Evelyn Pilcher,  
Secretary and Editor.**

have pleasure in assuring the Association that they will continue to devote their best endeavors to securing the perpetuation of its prosperity.

The thirteenth year of the Association's existence dawns most auspiciously. Its twelfth year has been replete with progress and fruitful in results. But its full development is yet far away. Much has to be done to complete the work already inaugurated, while many additional features in its development knock loudly for admission to its field of labor.



**Major Herbert A. Arnold,  
Treasurer.**

## SERVICE CONDITIONS IN RELATION TO RETIREMENT AND PENSIONS.

BY JOHN CROPPER WISE, M. D.

MEDICAL DIRECTOR IN THE UNITED STATES NAVY.

OF all the routine administrative work which the medical officer is called upon to perform, none is of more importance than the determination of the relation of disability to the line of duty.

That adequate provision for those invalided in the public defence is considered a debt of the highest dignity, is amply attested, by the many institutions for their care in this country, Greenwich in England, and the splendid dome of the "Invalides" in France. To convey some adequate idea of the further generosity of the United States, it can be stated that the disbursements for pensions were:

July 1st, 1790 to June 30th, 1865, \$96,445,444.23.

July 30th, 1865 to June 30th, 1903, \$2,804,408,857.22.

It will be observed that during the second period, or, that commencing with the Civil War, though the time was but half as long, the increase was over two and a half billions of dollars.

The medical officers of the Army and Navy, are more directly responsible in awarding this vast benefice of the Nation than any one else who has to do with the matter, not excepting the Commissioner of Pensions.

It is in the belief that this duty is not discharged with due regard to the important interests involved, that this representation of the subject is made.

The entry in the Medical Journal, (the first official record) the Hospital-ticket, and Report of Medical survey, disregard the regulations which require a statement of *all the facts*. These important papers, often show such a disregard in this connection, that the statement is often a bare assertion, and rarely a finding logically deduced from given facts.

The gravamen, on which determination of the question of line of duty principally hinges, is the entry made, on admission

to the sick-list. Upon the opinion there expressed all others are mainly grounded, and this is as it should be, for who can be more competent to judge of the relation of cause and effect, of disease or injury, of environment and general service conditions, than the officer, who has immediately and primarily to do with them all?

The causes of injury are obvious, the causes of disease are obscure. For this reason a correct determination in etiology, is a laborious procedure, but too often lightly entered upon. Ordinarily, a subject of vast limitation; in the Military and Naval life this limitation is largely extended.

Heredity, causes existing prior to enlistment, general environment, special causes, and peculiar conditions involved in certain acts of duty,—such are some of the etiological classes, with many subdivisions, which we are called upon to study.

In regard to the first, heredity, “there is a destiny made for man and his ancestors, and no one can elude, were he able to attempt it, the tyranny of his organization.” (Maudsley.)

It is very uncertain if we can, with any accuracy, trace the importance of this factor, as bearing on the health of recruits, as family history derived from their verbal statements are notoriously inaccurate.

DISEASES—Most important under this head are—

Tuberculosis,  
Alcoholismus,  
Alienation,  
Syphilis,  
Rheumatism,  
Valvular Heart Disease,—

the first being the most common encountered.

From the conclusions of Dr. E. J. Marsh, based on the careful investigation of 22,085 deaths, representing the entire mortality of of the Mutual Life Insurance Company, of New York, 1,994 showed a family-record of tuberculosis, and if the family histories were all truthfully stated, the latter figures would be greatly increased.

According to Le Grain, of 814 children born of parents addicted to alcohol, 322 were degenerate, and 174 died. Of the survivors, 177 were epileptic, and 14 hysteric.

Apoplexy is markedly hereditary, and is associated with the history of arterio-sclerosis and Bright's disease.



The hereditary etiology of diabetes and rheumatism are too well attested to need comment.

Causes found to have existed prior to enlistment clearly relieve the State of all responsibility, as a rule.

It cannot be maintained that the State accepts a man as in perfect physical condition, for the reason that some defects escape the examiner at the time of enlistment.

Very important exception is found to this proposition, in those cases where it can be established by fair clinical evidence, that the immediate cause and most potential agency of disease is found in service-conditions.

It is in the class of general environment, special causes, and peculiar conditions, that the majority of cases admitted to the sick-list in military and naval life, are found. This is an important fact, for from it can be deduced the principle that the large majority of cases of disability happening to the soldier and sailor originate in the line of duty.

The diagnosis made, the cause of the disability established, can it be shown that there is a relation of cause and effect, of consociation between the disease or injury and service conditions? In other words, to use the service expression, is it "in line of duty?"

This really difficult question has been rendered more complex by the discussion of unusual cases, which have arisen under peculiar circumstances. Such cases arise in all conditions, but they cannot be held of value in determination of the main point at issue.

It is a fact that since the Civil War, in the service, the term "line of duty" has steadily tended to a more liberal construction.

The humanitarian side of the question has gained ground, often at the expense of the legal aspect, until to-day, the cases which are not considered "in line of duty" are infrequent.

In too many instances the cause is assumed to be "in line of duty" and the "onus probandi" to the contrary, rests on the State.

The opinion seems to prevail in the Navy, at this time, that if one becomes disabled in the service, and vice can be eliminated

as a factor, the case is in line of duty. Personal imprudence is too often ignored. As to heredity, and family history, important as they are in civil practice, it is the rarest occurrence to find such influences figure in findings of Survey or other Boards.

From time immemorial the medical officer has sought some formula by which, as a principle, all cases could be decided; but it is questionable if such a talisman will ever be found. No two cases are similar, and most are unlike in their physiological, pathological and etiological composition.

A body of Medical Officers of the Navy, as late as 1882, expressed their view of this matter as follows:

"That a man or officer who is receiving pay, and is subject to orders, and who becomes disabled by disease or injury during his military career, should be considered as incurring his disability in the line of duty; the diseases or injury not being the result of any act of personal imprudence or impropriety, or existing prior to his entrance into the service, or the consequence of inherited disease."

This is, as a general expression, as equitable an opinion as could be framed by service-men; it is the *service interpretation* of line of duty; and a majority of medical officers find, in accordance therewith; not only is this a liberal, humane, and rational view, but this is not enforced in conformity with its strict construction. For instance, if a man was drowned by letting go the fall of a boat too soon, if he was killed or injured by an explosion, such as recently occurred on the battleship Iowa, and such death or injury was proven, beyond a doubt, the result of carelessness or "personal imprudence," no medical officer could be induced to find other than in the line of duty. We must recognize the fallibility of human nature, and the state should bear the onus in cases like these, which experience shows inevitable in such surroundings. Thus the attitude of the medical officer is invariably as much, or more that of the humanitarian than that of the attorney.

That the law authorities do not hold such liberal views is shown by opinions of the Attorney General of the United States, and the digest of the decisions of the Honorable Commissioners of Pensions.

In May, 1855, the Attorney General delivered the following opinion:

"When the statute provides pensions for disability or death, occasioned by wounds or injuries received, casualty occurring, or disease contracted in the line of duty, it intends that the performance of duty must have relation or causation, or consociation, mediate or immediate to the wounds, to the casualty, the injury, or the disease which produces the disability or death.

"To determine the right of pension, the question is not whether, when the cause of death or disability occurred, the party was on duty or not, but whether in any of the possible conditions of service the cause of disability or death was appurtenant to, dependent upon, or connected with acts within, or acts without the line of duty.

"Upon questions of casualty, the opinions of experts are evidence, but they do not furnish either exclusive or conclusive proof, and the question is to be judged by the real facts like any other matter of evidence.

"When the proofs as to the question of actor and subject are balanced, and it is impossible to determine by them whether the case be one of contemporaneity, or collocation only, or of cause and consequence, it is a reasonable inference of public policy to presume in favor of the service. It is according to public policy to presume in favor of the service, where the line of duty enters potentially into the cause of disability or death, although it be not certainly provable that it was the exclusive or predominant cause."

This is the *legal or state interpretation*. It clearly leans to decisions in favor of the state in all cases, "not easily provable," while the service interpretation invariably gives a claimant "the benefit of the doubt."

The service interpretation considers disability or death occurring while in the service, be it on duty, leave or furlough, while attached to a ship or post, while temporarily absent, going or coming to perform a certain duty or duties, as originating in the line of duty. It is an interpretation so liberal as often to be unjust. The legal or state interpretation, on the other hand, construes the statutes and regulations in the strictest sense. It does not consider the question of furlough, leave or duty, but in their relation "of causation or consociation" between the performance of some act of duty, and the disease or injury.

The medical officer can never have a clearly judicial mind, he is always the doctor, and the claimant, the weaker party to the contention, is a shipmate and comrade.

The animus of the judicial officer is to serve the State.

As so much depends on the decisions of the Honorable Commissioner of Pensions, the views held by this officer are very important.

To Medical Inspector Flint, in 1883, the Commissioner wrote as follows:

"The questions arising upon this point of law are innumerable, and depend so nearly upon the facts in the case, that it is difficult to lay down an exact rule. But the principle by which I test such cases is primarily:

"Did the service or special act, through the performance of which the disability was incurred tend to the permanent or incidental benefit of the service in which the man was enlisted?"

An exceptionally liberal construction of the term "line of duty" was announced by the Honorable C. B. Smith, Commissioner in 1862. This officer held that a soldier was in line of duty "while under orders and obeying Army regulations, and that the presumption is, that every person engaged in the public service performs his duty until the contrary is shown."

It is not proposed to discuss the law as applying exceptionally. Certain it is, that no one in the service will consent to be guided by many of the legal decisions. Thus, when a soldier contracted disability while confined in a military prison on charge of desertion, it was held that he was not in line of duty, as the imprisonment was in consequence of a violation of law (Digest, page 159, No. 26). Compare this with Article 1829, paragraph 1 United States Regulations, which provides, "whenever any person shall be sentenced for a period exceeding ten days to confinement on diminished rations, or on bread and water, there must appear on the face of the record of the proceedings, the certificate of a Medical Officer to the effect that such sentence will not be seriously injurious to the health of the prisoner."

## ANTI-TYPHOID INOCULATIONS.

By E. H. WILSON, M.D.,

BROOKLYN, N.Y.

DIRECTOR OF THE HOAGLAND LABORATORY.

**I**N spite of our extensive knowledge of the etiology of typhoid fever and of the methods of its dissemination, the experience of the English in South Africa and our own experience in the late war with Spain, only confirms the statement that "typhoid fever is the greatest scourge of modern armies." It is the inseparable companion of armies in time of war; all the conditions often favoring its development; fatigue, the occupation of a polluted soil, defective food, pollution of the food and water supply, all tend to bring about a condition which often impedes military operations and even invalidates their results. Military surgeons should, therefore, be deeply interested in the prophylaxis of typhoid fever, and be posted in the progress made toward this end. When we consider that in the mobilization of our volunteers, thousands of men at the age most susceptible to typhoid, were brought together under unusual conditions, in portions of the country where the disease was endemic, that these men, not being professional soldiers, did not at first appreciate the necessity of a proper sanitary administration; the wonder is, not that we had some typhoid, but that we did not have a great deal more. The methods at our command to protect our camps from typhoid are simple: the isolation of the sick, the disinfection of the discharges, and the protection of the food and water supply. If these could be strictly carried out, typhoid could not gain a foothold, but in practice it is not possible to do this. Men will drink forbidden waters, and the ubiquitous house fly will visit the latrines and the mess tent. It must be distinctly understood that the writer is far from intending to disparage these, our only practical means of safeguarding our soldiers from typhoid, but it

would seem that if it were possible to protect them from typhoid as we protect them from smallpox, namely by immunizing the individual soldier, the problem would have advanced a long way toward its solution.

To render the individual soldier refractory to typhoid fever would be beyond dispute the best of all prophylactic measures.

We know from the work of Sanarelli, Chantemesse and Widal that we can immunize animals against the inoculation of a fatal dose of typhoid virus, but can we conclude from the methods used in experimental immunization; that they are applicable to man?

R. Pfeiffer (1) used sterilized cultures of the typhoid bacillus for prophylaxis. Levy (2) followed Pfeiffer in the opinion that immunity could thus be established.

The first practical application of this method on any scale, was made by Major Wright (3) of the Army School at Netley, and before detailing the results of these inoculations, it may be well to say a few words of the method of preparing the prophylactic fluid which was used.

The method of preparing the prophylactic fluid is described by Wright and Leishman (4). The vaccine consisted of a lysolized (1% lysol) four-weeks-old culture of a virulent typhoid bacillus.

The virulence of the culture used in the preparation of the virus was established and maintained by a series of intraperitoneal passages through guinea pigs. The culture medium used was ordinary broth with 1% pepton, accurately neutralized. Wright used culture flasks holding about two and a half litres, with a lateral tube near the bottom to which a rubber tube was attached which was plugged with a piece of glass rod, and furnished with a pinchcock. The flask was inoculated by puncturing the rubber tube with a hypodermic syringe. After inoculation, the flasks were incubated at thirty-seven and a half degrees C. for from 14 to 21 days, after which there was little or no growth. The contents of the flask was then transferred to a mixing jar which is furnished with a paraffin thermometer to record the internal temperature of the culture and to show the point when it has reached

60 degrees C. The jar is heated in a water bath from ten to fifteen minutes after the internal temperature has reached 60 degrees C. After cooling, its sterility is tested by culture and a portion is drawn off for standardization and to the rest is added one-fifth of its bulk of a 5% solution of lysol. If the lysol is added in a concentrated form it causes a massing of the bacteria.

Two methods are employed to standardize the virus: one is a turbidity test, the other is a physiological test by subcutaneous inoculation of guinea pigs.

Inasmuch as the virus includes the dead bodies of the bacteria, the degree of the turbidity is an index of the number of undissolved bacteria in the mixture. The test is made by examining the fluid in a cell under the microscope, and referring the turbidity to a scale.

The toxicity of the vaccine is determined by injecting a series of guinea pigs with doses of 0.5, 0.75, 1, and 1.5 c.c. The pigs should weigh from 250 to 300 grammes each. Death usually takes place on the second or third day. The minimum toxic dose is 0.5 c.c. per 100 grammes of body weight. The dose for man is influenced by the turbidity and the toxicity of the individual brew of the virus. When the turbidity is great and the minimum lethal dose was 0.5 c.c., the dose for man was fixed at 0.5 c.c. On the other hand, doses as high as 1.5 c.c. have been used when the toxicity and the turbidity was low.

Following is the injection of this virus in man, there is a certain sequence of events regarding which Wright says (7):

First. That when the quantum of antityphoid vaccine employed produces well-marked constitutional symptoms, a decrease in the bactericidal power of the blood, and a corresponding increased susceptibility to typhoid infection may supervene in the period immediately subsequent to the inoculation; upon this negative phase of increased susceptibility to typhoid infection however, there may be expected to succeed probably within a period of three weeks or less, a phase of increased bactericidal power and a greater resistance to typhoid.

Second. That when the quantum of antityphoid vaccine em-

ployed produces severe constitutional symptoms a negative phase of increased susceptibility will be produced, which may never be followed by a positive phase of increased resistance.

Third. That when the quantum of antityphoid employed is reduced to the point at which marked constitutional disturbance is avoided, a positive phase of increased resistance may be expected to supervene without the intervention of any negative phase, and in many cases within 24 hours.

#### RESULTS:

Wright and Leishman (4) give the results of the first experiments made in India in 1898-9.

There were 2835 inoculated and 8640 were uninoculated.

There were 27 cases in the inoculated or 0.95%.

There were 213 cases in the uninoculated or 2.5%.

There were 5 deaths among the inoculated or 0.2%.

There were 23 deaths among the uninoculated or 0.34%.

Taken as a whole, this would appear to show that a certain measure of protection was conferred by the inoculation.

In the 15th Hussars in India (5) the morbidity among the inoculated was 0.55% and the mortality 0.27%. In the uninoculated the morbidity was 6.14% and the mortality 3.35%.

Wright (6) reports the results of the inoculation of 1705 officers and men at Ladysmith.

Not inoculated 10529, inoculated 1705.

Number of cases in uninoculated 1489.

Number of cases in inoculated 35.

Proportion of attacks to number of men: uninoculated 1 in 7.07, inoculated 1 in 48.7

Number of deaths from typhoid: uninoculated 329, inoculated 8.

Proportion of deaths to total men in group: uninoculated 1 in 32, inoculated 1 in 213.

Proportion of deaths to total number of attacks: uninoculated 1 in 4.52, inoculated 1 in 4.4.

Results obtained by inoculation among the officers of the garrison at Ladysmith: uninoculated 171, inoculated 44.

Number of cases: uninoculated 43, inoculated 9.



Proportion of attacks: Uninoculated 1 in 4, Inoculated 1 in 5.  
Number of deaths: Uninoculated 5, Inoculated 2.  
Proportion of deaths to number of men: Uninoculated 1 in 34.2.  
Inoculated 1 in 22.

These results would appear to be distinctly encouraging, inasmuch as they show that the proportion, on the one hand, of attacks and on the other, of deaths from typhoid was seven times smaller in the inoculated as compared with the uninoculated.

Marsden (8) used the method in the immunization of nurses serving in the typhoid wards of hospitals. He refers to the ephemeral fever following the inoculation as a possible mild attack of typhoid and says "I think its very mildness would speak only too strongly for the contention that there is an increased resistance to typhoid infection." Cayley (8) does not believe that the statistics from the army can be of much value, as the details could not be sufficiently worked out; but he does believe that the attacks of typhoid fever in those who had been inoculated were milder, and that the disease was of shorter duration. Rolleston (10) sums up his results in the Yeomanry Hospital at Pretoria as follows: 1st. That antityphoid inoculation does not absolutely protect against a future attack of typhoid. 2nd. That when a second attack occurs in an inoculated person there is an interval of at least six months. 3rd. That inoculation protects against a fatal termination of the disease.

Foulerton (11) goes very thoroughly into the matter and concludes that it is not a procedure for general application but should be confined to soldiers and nurses serving in the army and in typhoid hospitals. He also urges the necessity of repeated inoculations. Washbourn (12) disagrees with Rolleston in his observations at Pretoria, and is not inclined to view it with favor, although he admits that the inoculation protects for a few months. In a subsequent article (13) he expresses the opinion that the mortality was greater among the inoculated than among the uninoculated.

It will be seen from all this testimony, that in protective inoculation, properly practiced, we have a prophylactic measure

upon which it is too early to express a final opinion, but which is worthy of further trial.

#### BIBLIOGRAPHY.

1. R. Pfeiffer, *Deutsche Medicinische Wochensch.* 1896 22 p 735.
2. Levy. *Wiener Klinische Wochensch.* 1897 10 p 746.
3. Wright, *British Med. Jour.* 1897 1 p 266.
4. Wright *British Med. Jour.* 1900 Jan. 20th.
5. Wright *British Med. Jour.* 1901 Feb. 9th.
6. Wright *Lancet* 1900 July 14th.
7. Wright *Lancet* 1901 Sept. 14th.
8. Marsden *British Med. Jour.* 1900 April 28th.
9. Cayley *British Med. Jour.* 1901 Jan. 12th.
10. Rolleston *British Med. Jour.* 1901 Oct. 5th.
11. Foulerton *Lancet* 1900 June 2nd.
12. Washbourn *British Med. Jour.* 1901 April 23rd.
13. Elliot and Washbourn *Lancet* 1902 Jan. 18th.

#### THE CANTEEN IN DENMARK.

THE Danish Secretary for War has prohibited the sale of spirituous beverages in the permanent establishments of the army and forbidden the retailing of spiritous liquors from the canteen during field service. Hitherto the regulations have made brandy a feature of the ration but this regulation also is now repealed.

HANS DAAE.

#### MEDICO-MILITARY INNOVATIONS IN THE SWEDISH ARMY.

MANY innovations have been made in the recent organization of the Swedish Army. The number of medical officers has been increased and their pay has been made larger, but at the same time their period of annual service has been prolonged. Hereafter medical students who are fit for bearing arms are to serve in the combatant ranks. Medical students who are not fit to bear arms are assigned to the medical department. In war they are to be employed at the hospitals of the rear or at the base.

HANS DAAE.

## THE NECROLOGY OF THE ASSOCIATION FOR 1902-1903.

By LIEUTENANT COLONEL NATHAN STURGES JARVIS,  
BRIGADE SURGEON IN THE NATIONAL GUARD OF NEW YORK; CAPTAIN,  
RETIRED, IN THE UNITED STATES ARMY; CHAIRMAN  
OF THE NECROLOGY COMMITTEE.

**D**URING the Association year 1902-1903, we have lost by death seven members, three from the Army, one each from the Navy and the Public Health and Marine Hospital Service, and two from the National Guard.

**Major Walter Reed,** Surgeon U. S. Army. It is with no little hesitation that we submit this inadequate tribute to one who has built an imperishable monument to his own memory; for in the untimely passing away of Major Walter Reed, Surgeon U.S.A., on the 22nd of November, 1902, this Association and the great American nation mourn the loss of one of the greatest, if not greatest benefactor of this new century. All that has been said and written in gratitude to Jenner, Pasteur



**Major Walter Reed.**

and Lister, is equally appropriate to Walter Reed. For if gratitude is measured by benefits conferred on mankind, he shares with these great and useful devotees of science the love and blessings of countless thousands now and to come.

In fact, it would be impossible to estimate the saving in life and treasure, the possibilities of development in territory uninhabitable by the Anglo-Saxon, the sense of confidence granted to our oft-afflicted Southern States which his unselfish labors have brought about.

In the prime of life, 51 years of age, his active mind was ripe for more practical and useful discoveries in the broad field of scientific medicine. This Association may well be proud in that his name was enrolled among its illustrious members. It is hardly necessary to attempt a detailed description of his painstaking, systematic and fearless experiments, now so well known to all, which proved to the world the fact that the mosquito is responsible for the transmission of the dreaded scourge "Yellow Jack."

That *Stegomyia fasciata* is the intermediate host through which the disease is not only carried from one victim to another, but may explain its spread at great distance from the original focus where local conditions are entirely different, is now accepted by the most skeptical. Born in a state which gave to the nation Washington, Jefferson, and scores of others, whose names are recorded upon its roll of honor, Virginia has new reason to boast of its sturdy sons.

Reed's early education was obtained in the common schools of his native town, Harrisonburg, his medical training at the University of Virginia and the Bellevue Hospital Medical College of New York, from which he graduated in 1872. He entered the Medical Department of the United States Army in 1875.

During his career of 27 years on the frontier and elsewhere, Reed was considered by the War Department as of the faithful and reliable type of man, who could be depended upon to do the best in his power, in all situations, at all times.

Reed and his associates, Carroll, Agramonte, the lamented Lazear, and Gorgas,—who so skillfully confirmed Reed's deductions,—give further evidence, if such were needed, that no more gallant, clear headed men are found than we meet in the ranks of the unostentatious medical profession.

Reed was not immune to the dread disease which he so calmly faced, but the fate of Lazear and hosts of others in no way interrupted his experiments nor disturbed his equanimity. Heroism so commonly vaunted on the field of battle, where all is excitement and stimulation, is of small import compared with such as this; how aptly Whittier has expressed the idea in his *Hero*:

"Dream not helm and harness—  
The sign of valor true,  
Peace hath higher test of manhood  
Than battle ever knew."

**Lieutenant Colonel William Arnold Adams**, Surgeon Texas Volunteer Guard, died at his home, Fort Worth, Texas, October 15, 1902, in his 49th year. Dr. Adams was one time Vice President of the Texas State Medical Society, a member of the American Medical Association and a delegate to the Pan-American Medical Congress. Among the many positions of honor creditably filled by him was that of Professor of the Principles and Practice of Medicine at the Medical Department of Fort Worth University; he was also Division Surgeon to the Chicago, Rock Island and Texas R.R., Surgeon to the Texas Pacific, Southwestern and 'Frisco Systems.



Lieut. Col. William Arnold Adams.

Mercer University, of Georgia, had conferred upon him the degrees of A.M. and LL.D. Our lamented colleague was one of the most highly esteemed men in the State of Texas, and his untimely death is mourned by thousands of devoted friends throughout the great Southwest.

**Dr. Charles Ellsworth Jackson**, Contract Surgeon United States Army, died at his home, Canal Fulton, Ohio,

October 30, 1902, aged 33 years.

The circumstances leading to his untimely death were peculiarly sad, exemplifying again the many deadly perils to which the faithful physician is exposed in the performance of his humane duties. While operating on a private soldier of the 16th U.S. Infantry, our associate wounded his left thumb, developing a virulent and rapid toxaemia, terminating in paralysis and death. Dr. Jackson's service in the Army had



**Dr. Charles Ellsworth Jackson.**

been entirely in the Philippines, a period of nine months.

**General James Thomas Jelks.** Surgeon General Arkansas National Guard, died from heart disease at his home, Hot Springs, June 24, 1902, aged 53 years. He was a native of Alabama, receiving his degree at the University of Nashville. While a mere boy Dr. Jelks had carried a musket in the Confederate Army. Our deceased colleague was well known to the medical profession of the country, having contributed liberally and instructively to



**Gen. James Thomas Jelks.**

various medical journals upon a wide range of topics. He was at one time secretary of the section on gynæcology and obstetrics at the American Medical Association, and chairman of the section on surgery and anatomy; he was also a respected and active member of many other medical societies throughout the West. As a teacher, Dr. Jelks was well known, having filled with credit the chairs of genito-urinary surgery and gynæcology in Barnes Medical College. At the time of his death he was editor of the *Hot Springs Medical Journal*.

**Captain Franklin M. Kemp**, Assistant Surgeon U.S. Army, died at his post of duty, Nueva Caceres, Philippine Islands, February 23, 1903, aged 30 years. Dr. Kemp entered the Medical Department of the Army in 1896, from the State of New York. His medical education was obtained at the Long Island College Hospital. In 1898 he performed most arduous service as Surgeon to the Government relief expedition in behalf of the Klondike miners. While on that duty, he met with a painful injury, an accidental gunshot wound of the thigh, and it is thought that his subsequent and untimely death was in some way associated with this misfortune. Dr. Kemp was present in the attack on Manilla by General Merritt and in the subsequent operations against the Philippine rebels. He was spoken of as a cool, gallant and reliable Medical Officer; a man of commanding figure and striking personality, he will long be remembered with affection by his Army associates.



**Captain Franklin M. Kemp.**

**Surgeon John Vansant**, Public Health and Marine Hospital Service, Brevet Lieutenant Colonel U.S. Army. Few men have passed through more varied and adventurous scenes than our late esteemed associate, Surgeon John Vansant, P.H. & M.H.S., who died at his station in, Charleston, S.C., December 12, 1902, at the age of 71. Dr. Vansant was a native of Virginia, and an honor graduate of Jefferson Medical College, class of 1854. Entering the U.S. Navy as Assistant Surgeon in 1856, he was first attached to the Asiatic Station, participating in the attack and destruction of the barrier forts below Canton, China, an historical event of considerable interest—the first intimation to the far East that a nation of great



**Surgeon John Vansant.**

power and energy had sprung up upon the American continent. Dr. Vansant resigned in 1860, but at the outbreak of the Civil War accepted a commission as Assistant Surgeon in the U. S. Army. His war record embraced duty as an inspector of Depot Hospitals, with the 3rd Army Corps of the Potomac, the Lincoln General and Hammond General

Hospitals. During the reconstruction period he served as Medical Inspector on the staff of Gen. Philip H. Sheridan.

In recognition of faithful and meritorious war service, the brevets of Lieutenant Colonel and Major U.S.A. were conferred upon him. Resigning in 1867 to enter civil practice on the Pacific Coast, he became the first professor of anatomy, medical department of the University of California. Appointed a Surgeon of the Marine Hospital Service, he was in charge of various hospitals in many of larger cities in the United States. A generous contributor to medical liter-



ature, his long and extensive experience offered abundant opportunity for observation and research; his active mind, however, did not confine itself to medical lore, for he associated himself with many literary and scientific bodies throughout the country.

**Medical Director George Worth Woods, U.S. Navy.** Your committee reports with sorrow the death of our distinguished colleague, George Worth Woods, Medical Director U.S.N., on the 10th of June, 1902. He was a former Vice President of the Association and an active contributor to its work and literature. Dr. Woods entered the Navy from the State of Massachusetts in 1861, on the outbreak of the Civil War, in which he saw extensive service with the blockading squadron. Subsequent to the war his record embraced sea duty with the Pacific, Atlantic and Asiatic squadrons. A fluent and interesting writer, his contributions to medical literature embraced essays on dysentery, fractures of the skull, intestinal obstruction, appendicitis, "X-rays" machines, etc., indicating a mind ready to grasp the latest and best in medical research. Dr. Woods retired in 1900, after a long



**Medical Director George Worth Woods.**

career of faithful and devoted service; he was a tender hearted, sympathetic, broad minded physician, and will be held in affectionate memory by his associates.

## THE MEDICAL DEPARTMENT IN CHINA.

By MAJOR FRANCIS J. IVES.

SURGEON IN THE UNITED STATES ARMY; CHIEF SURGEON OF THE CHINA  
RELIEF EXPEDITION.

WHEN the so-called Boxer outbreak occurred in North China in the early summer of 1900 and the foreign legations in the city of Peking were threatened, the Ninth United States Infantry was directed to proceed there from Manila. This regiment was fully equipped for field service, was accompanied by three Medical Officers and the usual allotment of members of the hospital corps and medical supplies suitable for the command.

After the famous battle of Tientsin on July 13th, during which the Ninth sustained heavy losses, the large nations of the world realizing that a campaign of great magnitude was imminent, took immediate measures to push extensive bodies of troops to the Orient as expeditiously as possible. The United States was prepared to send from 12,000 to 15,000 men, and regiment after regiment embarked from San Francisco. In the meantime the Fourteenth Infantry, the Sixth Cavalry, a Battery of Field Artillery and a Battalion of the Marine Corps were landed, which increased our contingent to about 3600 men. Of these about 3000 took part in the march to Peking, the capture of that city and the relief of the legations. Soon after the latter event additional troops landed, which increased the American force to about 5000 officers and men. Owing to the cessation of hostilities the balance of our troops destined for China were turned off at Nagasaki, Japan, and proceeded from there to Manila.

The Medical Department had not been idle during this time. A 300 bed field hospital, shipped from Manila, was established at Tientsin shortly after the occupation of Peking, and as additional supplies arrived, this assumed the character of a base hospital for the troops at the front, besides accommodating the sick from the

command remaining at Tientsin. In addition the Surgeon General of the Army had ordered a 1000 bed hospital, fully equipped, to be shipped from San Francisco and Manila and a Medical Supply Depot to be established. On account of the reduction of the command, only a portion of these supplies were ultimately utilized. But it is gratifying to know that the Department was prepared to afford ample accommodations for our forces as originally contemplated.

A large contingent of Medical Officers and hospital corps men were ordered to the scene, so that the personnel at this time consisted of six officers with the rank of Major, three Assistant Surgeons, twenty Contract Surgeons, about 200 members of the hospital corps and 15 female nurses. The hospital ship Relief lay at anchor off Taku and served as an ultimate base. To meet such contingent expenses as might occur, the sum of \$100,000 was turned over to medical disbursing officers by the Surgeon General.

Considerable criticism was made by certain of the sensational press regarding the unnecessary suffering amongst our sick and wounded during the early days of the campaign, but as a matter of fact, our disabled soldiers were handled as expeditiously and skillfully as those of any other nation there represented. At the battle of Tientsin the unfortunate position of the Ninth Infantry was such that they could neither advance nor retreat without almost complete annihilation. It was therefore impossible for the Medical Officers and their assistants to move from place to place. On that account a large number of the wounded were forced to remain unattended until the regiment fell back after dark. A temporary field hospital was then immediately established in the foreign section of the city to which the wounded were removed.

The relief column consisting of the Japanese, Russian, American and British forces, that being the order upon which it was agreed they should march, left Tientsin on August 4th, arriving to within a few miles of Peking on the 13th. The position of the American troops in the column was a particularly trying one. The Japanese being first in line, would begin the days march in

the cool of the early morning untrammelled by dust, the great scourge of that country. The Russians, although not quite so fortunate, would have the advantage of an hour or so of morning. The Americans, who kept close behind the Russians, could rarely leave camp before eight o'clock, and sometimes later, and were then subjected not only to the intense heat, but were unable to evade the dense clouds of dust naturally raised by those preceding them. This occasioned the most acute hardship and officers, who have participated in many trying campaigns, stated that this march, although comparatively brief, was the severest they had encountered. The British, who followed the Americans, usually struck camp towards evening, so they escaped in a great measure the hardships of our troops. Only one important engagement was participated in by our troops on this march prior to the attack on Peking. At Yangtsun, about 28 miles north of Tientsin; a large body of the Chinese Imperial troops were encountered. In the fight that ensued our losses amounted to seven killed and 59 wounded. These latter received prompt medical attention and within thirty-six hours all were safely housed in the hospital at Tientsin.

This was accomplished most expeditiously by using junks on the Pei-ho. As the stream flowed within a comparatively short distance of the scene of the fight, the wounded were collected on its banks and the junks afforded a most comfortable method for their further transportation. As the column did not continue the march until the 7th, it was thus enabled to leave Yangtsun without the incumbrances of sick or wounded.

In this connection it would be interesting to state that the Pei-ho, although navigable for the smaller steam craft from Taku to Tientsin, is utilized for water transportation for many miles beyond by using junks towed by coolies. At Tungchow, 14 miles from Peking, a canal connects that city with the river. This canal had been rendered unserviceable by the Boxers, so that Tungchow was practically the shipping point on the river for Peking. Owing to the tortuous course of the stream, the distance between Tungchow and Tientsin was about 120 miles, although the railroad between Tientsin and Peking, which was not

in operation until the following December, reduced the distance to about 80 miles. The rapidity of the current in the river renders passage against it a slow and tedious process, but the journey downwards is swift and easy. This, whilst retarding the prompt arrival of supplies from Taku, enabled the sick to be transported down stream with comfort and facility.

As the column advanced towards Peking, it became necessary to leave strong guards at various strategic points on the river to effectually guard the base, which guards were composed of contingents from the various co-operating forces. With our troops they were usually composed of those who, although not too ill to go upon sick report, were nevertheless unfit to continue with the army on the march. This gave rise to published statements of the large number of sick left behind, whereas these men performed the same duties that perfectly well men would have otherwise been called upon to do, and thus a more effective force on the fighting line was maintained.

After the occupation of Peking and prior to the closure of the river by ice in the latter portion of November, the Pei-ho proved of the greatest value for the transportation of our sick. The overland trip from the capital to Tungchow of 14 miles, was accomplished by means of the regulation ambulance, of which we had sufficient. Only the most serious cases and those capable of enduring the journey, were transferred. Beyond the ride to Tungchow the trip on the river was fraught with so little discomfort that the proposition of transportation to our base hospital and hospital ship was a comparatively easy one. The various camps along the river between Tungchow and Tientsin, although supplied with Medical Officers and suitable equipment for the care of mild cases, were enabled to forward such sick as required prolonged hospital treatment to the base at Tientsin with no delay, as flotillas of junks, under American control, were passing their camps almost daily, and the admirable management of the Signal Corps afforded ready communication, so that boats could always be stopped on their passage down the river.

The medical equipment of our forces on the march consisted of the field regimental equipment. Each man carried his first aid

package, the hospital corps men the regulation pouches, Medical Officers were supplied with medical and surgical chests. For transportation there were four red cross ambulances and a number of the regulation hand litters. No movable field hospital accompanied the command, nor do I believe did any other contingent have one. The other nations were similarly equipped with the exception of the ambulances, ours being the only ones in the relief column.

Many sensational reports were circulated regarding the tremendous sick report amongst the American troops during the active period of this campaign, but the actual records indicate that when the command left Tientsin on August 4, 1900, there were 3.8 on sick report; on August 8, after the battle of Yangtsun, with the casualties incidental thereto, 5.5; August 11, after leaving Matao it was 7.4; on August 17, 8.6; between August 20 and 31, the highest figure, 11.6, was reached. From then on it rapidly decreased. When all the circumstances of this campaign are considered, these figures are not excessive. Our troops after two years arduous service in the Philippines, with all the debilitating influences incidental thereto, were suddenly transferred to a different climate and subjected to one of the most arduous ordeals in recent warfare. The only wonder is that the number of sick was not materially greater. The fact that it was not is, I believe, in great part due to the thorough manner in which the Medical Department had studied the proper measures for the guidance of the health of troops in the field, and secondarily to the sanitary lessons they have instilled into the officers of the line, who now co-operate so cordially with us in all matters pertaining to the health of their commands.

When I reached China towards the middle of September and soon afterwards was assigned to duty as Chief Surgeon of the American forces, the machinery of the Medical Department was operating as successfully as was possible under the conditions then existing. As previously stated, the Hospital Ship Relief, with a capacity of over 250 beds, was at anchor off Taku. The general hospital at Tientsin, with 250 beds, had been located in a commodious compound, there being on hand sufficient addi-

tional supplies to double its capacity if necessary. This hospital was under the command of Major William Stephenson, Surgeon U.S. A., and as assistants he had eight medical officers, about 40 members of the hospital corps and 15 female nurses belonging to the corps of trained army nurses. The hospitals of the British and French at Tientsin were visited, but in completeness of equipment none compared to this.

At Peking things had practically remained at a standstill since the military occupation of that city, but in the Temple of Agriculture, where the majority of our troops were encamped, a field hospital had been established. This was located in one of the large temples, and although very sparsely supplied as to equipment, a certain degree of organization had been effected and a diet kitchen put in operation. Some adverse criticism has been made that this hospital was not more promptly equipped after the military occupation, but owing to the uncertainty of the future operations, the scarcity of junks and the length of time required to transport stores to Peking, the shipment of stores, except the necessary commissary and quartermaster supplies, was suspended until such time as the definite plans of the War Department were received regarding the ultimate disposition of our forces. This caused a delay of a few weeks, but in the early portion of October I was directed by the Commanding General of the China Relief Expedition to make suitable arrangements for the care and accommodation of the sick of a command of about 2000 for one year. This constituted our contingent in China until the final withdrawal, in the spring of 1901, of all but a legation guard of 150 men.

A few days after the arrival of the co-operating forces in Peking the Commanding General of the American troops located the larger portion of his command at the Temple of Agriculture, maintaining a provost guard in each of the two American sections and one company at the south entrance to the Forbidden City.

The Temple of Agriculture is a large oval enclosure situated in the extreme southern section of the Chinese city, surrounded by a massive wall fifteen or twenty feet in height, with only two gates or entrances and enclosing about three hundred acres of

ground. Its site is elevated above the surroundings, is well drained and in no place are the city residences in juxtaposition to the wall. The main enclosure is partitioned by high walls into five or six subdivisions, and in the centre are situated the altars, temple buildings and residences of the priests and caretakers. The ground is covered with grass and there are a number of groves and avenues of cedar trees, many of a great age and proportionate size. For hygienic and military reasons a more desirable location could not have been fixed upon.

Owing to the unsettled state of affairs and the confusion incidental to an active campaign, but little could be accomplished in the first few weeks to improve the condition of the sick, but a system of sanitation for the entire command had been inaugurated and enforced, and as soon as General Chaffee authorized the shipment of supplies from Tientsin the Commanding Officer of the General Hospital at that place was directed to forward equipment for 150 beds with additional supplies in the way of field furniture, kitchen utensils and medicines, so that early in October the field hospital was possessed of all the essentials for the proper care of the sick and the regiments and detachments amply provided for.

In the meanwhile active operations were set in motion towards the permanent arrangements for the winter. It had been decided that the main body of the troops, consisting of about 1500 men, should remain in Peking; of the remainder one company was stationed at Tungchow and a garrison of two companies at Tientsin. The General Hospital at the latter place was discontinued on November 11, and a post hospital of 20 beds, fully equipped, established. At Tungchow a small field hospital of six beds was deemed sufficient, as all serious or protracted cases could readily be transferred to Peking. In Peking two hospitals organized as independent commands were located, known respectively as United States Military Hospital Nos. 1 and 2. Military Hospital No. 1 was situated in the Temple of Agriculture being located in one of the compounds where three of the large temples could be utilized. This hospital had a fixed capacity of 85 beds, but could be increased to 100 by crowding, and still further en-



larged to 150 beds by occupying adjacent buildings should the necessity present itself. These temples, owing to their peculiar construction, were poorly adapted for hospital purposes. They consisted of massive walls without openings of any kind on three sides and in front a series of lattice work doors extending in height to within a few feet of the eaves. The interior of each was a single hall extending to the roof. Their depth was about 30 feet and height to the ridge about 25 feet; in length they varied from 80 to 150 feet. The necessity for occupying these buildings was imperative, as the winter season was approaching and no time existed to construct wards in accordance with modern ideas. We were therefore compelled to exert our ingenuity to convert these vast barnlike interiors into wards which could be suitably heated, lighted and ventilated. The walls being from three to four feet thick it was impracticable to cut windows, except in a few instances. The lattice work doors, which were so arranged as practically to throw the entire front of the buildings open during ceremonies, were closed and securely sealed with the exception of a few used for entrance and egress. These doors were about four feet wide and in every alternate one a glass window three feet square was inserted, which windows could be opened when desired. The open lattice work of the remaining doors and those sections not used for the windows, were covered on the interior with ordinary white wall paper. This system of utilizing lattice work covered with paper is much in vogue in China and seems to serve a very useful purpose. It is cheap, the heat in winter is retained and considerable light admitted. Doors, windows and often entire sides of the resident buildings are often thus covered, its only objection being the lack of securing proper ventilation, which seems with the natives to be rather an immaterial point.

Partitions were erected in the interior of the buildings at suitable intervals, so as to divide the space into the necessary compartments, and eleven feet ceilings constructed. These latter were entirely of Chinese design and conception. They consisted of a light bamboo or reed framework fastened to the immense rafters above, upon which a layer of brown paper and over

this one of ordinary wall paper were pasted. Although of the flimsiest character, they prove most serviceable, provided due care was exercised in regulating sudden draughts entering from without. On one occasion during a high wind an outside door was held open, which caused such a strong current of air, that the entire ceiling from a ward was torn from its fastenings and lifted several feet, resulting in its almost complete destruction. By observing proper precaution thereafter this did not occur again. By thus cutting off the spacious lofts the wards were most comfortably heated, the Quartermaster Department supplying excellent coal stores, there being an abundance of fuel. For ventilation, holes about 18 inches square were cut in the ceiling every 15 feet and openings were made in each end of the lofts, which by a trap door arrangement could be opened or closed by means of a cord below. All the interior walls were hung with white wall paper of a neat pattern, which made the wards and other rooms present a bright, cheerful and attractive appearance.

Prior to the completion of this work a Medical Officer was directed to proceed to Tienstin and Taku, and from the large assortment of medical supplies which had then arrived, to select a complete equipment for the entire command. As a result, this and all of our hospitals were excellently equipped with a full assortment of medicines, surgical dressings and hospital stores of all kinds. The folding field furniture was used in the wards and proved most serviceable.

Before the arrival of these supplies a number of "Gold Medal" cots had been obtained from the Quartermaster Department and had proved of invaluable service. Too much cannot be said in praise of this cot for troops in the field and for a movable field hospital. I do not believe any other can compare to it for compactness, lightness and strength. Although in our permanent arrangements it was discarded for folding cots with woven wire mattresses, and the adjustable folding cots with canvas bottoms, still, for all practical purposes, I think they would have served just as well, especially the new model, which stands several inches higher from the ground. These cots made a most

favorable impression amongst the foreign troops, and judging from their comments, were considered one of the most practical and useful articles of our equipment.

When the hospital was completed it consisted of three wards with the necessary bathing and closet facilities, a well equipped operating room, dispensary, diet kitchen, recreation hall and offices for the Medical Officers and stewards. In addition, there were quarters for the Medical Officers with their mess. The enlisted men of the detachment of the Hospital Corps were housed in tents within the inclosure, the same as other troops in the command, but a kitchen and dining room was erected for their use and for such patients as were not fed from the diet kitchen.

The personnel of the hospital consisted of four Medical Officers, Lieutenant H. L. Greenleaf, Assistant Surgeon U.S.A. being in command, about 40 members of the hospital corps and four female nurses. In addition to these, each command in the Temple of Agriculture and each independent command in the City of Peking, had one Medical Officer and several enlisted men of the corps attached. These were provided with the usual field equipment and such additional supplies as were deemed necessary in the usual cases of emergency.

I do not believe it would be amiss to state that the United States Military Hospital No. 1, in Peking, was in point of equipment the most up-to-date and complete hospital amongst the co-operating forces in North China, and it reflected in the most favorable manner upon the Medical Department of the Army. From the interest it excited, not only amongst the foreign Medical Officers and others in the line, it was evident our department had made a marked impression. Owing to the almost daily visits from these officers, a spirit of esprit prompted all connected with the hospital to maintain it constantly in as good a condition as possible, which contributed greatly to its success.

Hospital No. 2 was located in a vacant compound in the American section of the Chinese city, the buildings having been used by the Canton Club. It was thoroughly equipped for the accommodation of thirty patients, one ward of six beds being reserved for the officers, there being no suitable space for them in

the large hospital. This hospital received the sick from the commands on duty in the city. In the latter portion of February it was discontinued as a separate organization and its personnel, consisting of one Medical Officer, six members of the Hospital Corps and two female nurses, attached to Hospital No 1.

The sanitary conditions confronting the troops in the early portion of the campaign were of the most unfavorable character. All the drinking water in this section of China is derived from wells, many of which are necessarily contaminated, due to the absolute lack of all precautions on the part of the natives and the indescribably filthy condition of their towns and villages. It is a military impossibility to provide a suitable apparatus to purify the water on a march of this kind, and as soldiers are apt to drink whenever a chance presents itself, a certain amount of typhoid and digestive diseases are the natural consequences. In addition the extreme heat, the exhaustive strain of the march, exposure to rain without sufficient shelter and eating fruit and vegetables unsuitably cooked,—all these contribute to increase the sick list. Such was the case with the United States troops who, besides, were suffering from the effects of a protracted campaign in the Philippines. Our Sanitary Department, however, proved that the experiences of the Spanish and the Philippine wars had trained it well for the task in hand, and in a comparatively short space of time all preventable diseases had practically been eliminated. The records show that there were in all 77 cases of typhoid fever; in August 9, September 21, October 23, November 21 and December 3, and after that none. Of the 353 cases of dysentery (varieties not stated) there occurred in August 133, September 130, October 55, November 33, and two sporadic cases afterwards. Of diarrhoea and digestive diseases there were in all 2073 cases; in August 664, September 826, October 363, November 94, and in the four remaining months 136. There were 651 admissions to sick report for malarial diseases, but these were mostly due to a cachexia from previous service in the tropics. During the winter months there was an increase in respiratory diseases, due in great measure to the severe dust storms which prevail in that country. The records show that in August there

were from all causes 7.2 on sick report, in September 10.4; from then on there was a steady and downward decrease until in March it was only 3.5.

In my repeated visits to the various foreign hospitals, I endeavored to ascertain their percentage on sick report, especially in regard to preventable diseases, but was unable to obtain the desired information. Although perfectly willing to allow us to inspect and examine their equipment, they seemed extremely reticent in this particular. However, their wards, with the exception of the British, seemed to contain a large number of typhoid and dysentery cases, and this, too, during the months of February and March, when ours were free from them. The British forces were composed in large part of Indian native troops, who it is claimed are immune from typhoid. Were it possible to compare the records, I believe it could be easily demonstrated that the sanitary methods in the United States Army are more practically and thoroughly carried out than in any other service in the world. The results in Peking evidently showed that whereas certain diseases were eradicated amongst our troops they continued to develop in that of other armies, and appeared to exist to a very considerable and noticeable extent.

There were in all 85 deaths, exclusive of those who may have died after transfer to the Relief, of whom I possess no records.

The following is a list of the principal causes:

Killed in battle and died subsequently of wounds...	27
Dysentery.....	22
Pneumonia.....	10
Typhoid Fever ...	5
Miscellaneous .....	21
Total.....	85

The combined military occupation of China presented such unusual opportunities for studying and observing the methods and equipments of the great armies of the world, that much time was devoted by our Medical Officers in visiting the various commands for that purpose.

Their Medical Officers were universally courteous and cordial in their manner and gave the impression of being men of intelligence and ability. They afforded every opportunity to examine and scrutinize, and seemed anxious and willing to enter into friendly discussions on the merits and deficiencies of subjects under consideration. Particular attention was directed towards their field equipments, the character and quality of their hospital supplies and their organization. After a careful and very thorough examination of the supplies and equipments of these armies, I have no hesitation in asserting that the Medical Department of our Army was the best and most intelligently equipped of any there represented. This is not said with a spirit of boastfulness, but taking item for item, there were but few points on which we did not excel.

All of the troops of the various forces were supplied with the first aid package, more or less similar to those in our service, but none were as complete. The Japanese and Indian native troops were the only ones containing the triangular bandage, which experience has shown is one of the most valuable adjuncts. The contents of ours seem of better quality than most, but owing to the presence of the triangular bandage, they are a trifle more bulky. The hospital corps pouches were generally used, carried by a sling over the shoulder and containing a specified list of medical supplies. These pouches in many respects resembled those in our service, but no special feature of commendation were noticed. In the French army they used a saddle bag for the cavalry service, which is an advantage, as the jolting of the horse is liable to weaken and tear loose the sling when the pouch is carried across the shoulder by a mounted man.

Medical and surgical chests were adopted by all the contingents with the exception of the Germans, who substituted a medicine wagon. In the Japanese service each battalion is allowed one set of chests, two in number. These are of wicker work enclosed in a strong leather case. They are considerably larger than those in our department, but the contents are not nearly so complete. The French had a set of four panniers for each regiment. They are also of wicker work and the arrangement and

contents, from the standard of our regimental field chests, are practically obsolete. The British medical chests consist of a set of ten of apparently equal size and about the same dimensions as those in our service. The arrangement and contents of these chests are also obsolete. No regard seems to be given to compactness, and the British officers admitted that they could be vastly improved upon. The German medicine wagons are furnished respectively for battalions and field hospitals; one for each battalion (1000 men) and two for each field hospital. They are divided into compartments opening to the sides and rear and are very serviceable and complete. Those for the hospitals are heavier and on ordinary rough roads would require four draft animals. The interior arrangement consists principally of a series of drawers arranged vertically, which slide into the bed of the wagon on small rollers. When drawn out they present the appearance of small cabinets about three feet square opening to the front. They are rather elegant in design, and when arranged around a room in two rows, one above the other, give very much the appearance of a well appointed dispensary. The contents are well secured, the bottles are square and arranged in slots on shelves, so that the danger of breaking is slight. The medicines are principally tabloids, and the dressings are well selected and of good quality. Although this wagon gave a most favorable impression, it struck me that there was considerable loss of space, which could either be employed for additional supplies or eliminated, thus materially reducing the weight. This wagon is eminently serviceable for well equipped bodies of troops, but no provisions seemed to be made for detachments, or at least if there were such, we failed to observe them. They are better adapted for field hospitals than regimental use. In the latter case, as we know by experience, the question of animals is a perplexing and serious one. Should one or more of those attached to the medicine wagon sicken or die and no other be available, the service would be paralyzed. This would not be the case with the field chest, which could be placed on one of the other wagons of the command.

On the subject of transportation for the sick, I believe we are superior to any other service. For strength, lightness, compactness, comfort and neatness in appearance, our hand litter

proved superior to all. The "Dhoolie" litter of the British, weighing 50 pounds and requiring four bearers, is not practical in ordinary warfare, being only serviceable where coolie labor is abundant. The German and French litters are both heavy and cumbersome, the only material difference being that the latter have wooden instead of iron legs. The Japanese hand litter consists of a light stretcher with bamboo poles without legs. It is most serviceable on the battle field on account of its lightness, but is more or less flimsy in construction and unsuited for hospital purposes. In addition, they have a "rickshaw" litter, being nothing more than an ordinary rickshaw with a sufficiently long body to allow one person to sit in a half reclining position. Only three nations were supplied with wheel transportation for the sick, the United States, Great Britain and Germany. The British had a two wheeled vehicle—the "tonga"—used by the Indian troops, which could transport four in a sitting or semi-reclumbent position. It was drawn by two horses and would be well adapted for a very hilly country over rough roads, but does not compare in comfort with a four wheeled ambulance under the usual conditions. A comparison between the relative merits of the American and German ambulances strikes me as being absolutely in favor of the former. Our wagon is considerably lighter and in emergency can be hauled by two instead of four animals, which is hardly possible with the German. The seating capacity of both is the same (eight), but when necessary we can load six reclining patients, whereas the other has reached its limit with four. In the German ambulance the seats are arranged somewhat similar to our old style "red cross," and when in use appear unstable and rickety. For reclining patients, they use the regulation hand litter, four of which belong to each vehicle. Our method of making the seats and backs serve as litter beds is simple, compact and practical, as has been demonstrated in actual service.

In respect to the transportation of field medical supplies, I believe the United States Army is inferior to the German, British, Japanese, French and possibly many others. In our service, the Medical Department being dependent upon the Quarterter-



master's Department, is seriously handicapped and frequently subjected to adverse criticisms, which should not justly be laid at its door. The German medicine wagon fulfils the requirements in that service. In the Japanese and French services each regiment is furnished a small one-horse vehicle on two wheels, for the sole purpose of carrying the chests and such other medical supplies as may be deemed necessary. Such wagons could be so constructed as to readily follow troops in all but the most difficult country, be sufficiently strong to stand the usual wear and tear of the service and light enough to require but one animal. The Japanese wagon was small, low and moderately broad, constructed somewhat on the plan of railroad station trucks for handling baggage.

Many of the Foreign services are our superiors regarding field hospitals, for the reason that although we have abundance of equipment, there is no fixed organization and, as a matter of fact, what we ultimately designate as field hospitals are impromptu affairs organized when the occasion for their use arises. This is in a great part due to the scattered condition of our Army and the character of the warfare in which we have been engaged. All of the hospitals in Peking were designated as Field Hospitals, but upon the establishment of the various commands in winter quarters, efforts were generally made to place them upon the higher status of more permanent organization. With the exception of the United States Military Hospital No. 1, all were located in the thickly settled portions of the city and the buildings utilized were modified to suit the exigencies of the conditions in accordance with the views of the various Medical Officers in charge.

The British hospital was situated in a spacious compound known as the Chu-Yo-Foo palace, and possessed nothing in the way of equipment beyond that of their regulation field hospital, with the exception of a limited number of iron cots and bedding. It consisted in reality of two hospitals, one each for the British and Indian troops; this division being essential, owing to caste prejudices and the necessity of the food for native troops being prepared in certain ways. The hospital was clean, well venti-

lated, and the usual sanitary regulations enforced. There did not appear to be an unusual amount of sickness amongst the command, and although the native troops were thoroughly unaccustomed to the rigorous climate of North China, they seemed to stand the winter well and comparatively few succumbed to pneumonia or other pulmonary diseases.

The Japanese had two hospitals of 200 beds each. Their appearance was neat and orderly and the general administration seemed admirable. Their equipment, however, was more or less crude, the cots were extemporaneous and the bedding, clothing, etc., of inferior quality. Their operating rooms were provided with an excellent assortment of surgical instruments, which belonged to the field equipment. A number of cases of beri-beri existed; with this exception the sick list did not appear large. There did not seem to be any special arrangements for dieting the sick and the variety of medicines seemed limited.

The Germans established three hospitals, two with a capacity of 200 beds and one of 100 beds. They all were excellently administered, and in the matter of equipment were second to the Americans, although their equipment compared to ours, was in many respects crude. The cots were of iron, folding in the centre, with iron slats upon which the mattress rested. With the exception of a few, the latter were bed sacks filled with straw. The bedside tables, chairs, etc., seemed to have been rather roughly extemporized; the blankets and bed linen were of good quality and in abundance. The kitchen was well and systematically regulated and the plans for arranging the various diets were methodical and admirably managed. The class and variety of the food, however, was far inferior to that furnished in the American hospitals, which fact was chiefly due to our Commissary Department, which stands unquestionably the first in the world and was a marvel to all the armies assembled in China. One of the points in which the American Hospitals far excelled all others, was in the equipment of the kitchen and dining room. In the former we had the complete outfit as furnished by the Department for our garrisons and large hospitals, and in the latter we used the new mess chests, which contain all the necessary table utensils for 100 men. The other armies, without excep-

tion, appeared markedly deficient in this respect. On one point particularly, the Germans were superior to us, in that they had in operation a very complete and well conducted bacteriological and chemical laboratory. Although a certain amount of clinical work was done by our Surgeons, our equipment was very limited. The German's disinfecting plants for bedding and clothes were excellent and were better than those of any army in Peking. As previously stated, I failed to ascertain the extent and character of the prevailing diseases amongst them, but even to a casual observer it was apparent that their wards contained a large number of typhoid and dysentery patients.

As the Medical Department of the United States Army is practically without specific organization, it was therein different from any of the co-operating forces in China. The question of proper organization, however, is such a complex one, that arguments regarding any system may be advanced pro and con with equal force.

The Japanese organization is perhaps based on a more elaborate scale than ours. Each regiment has six Medical Officers, three hospital stewards and twelve privates of the hospital corps. Besides these forty-eight stretcher bearers (from each company) are detailed from the line. There is also a Sanitary Corps of 500 men attached to each division; this is usually under the command of a field officer of the line, and is divided into two companies of 250 men each. The first company assembles by detachments at the various regimental dressing stations and carry the wounded to a second line, known as "collecting stations," returning then to the vicinity of the firing line. The second company carry the wounded from the collecting stations to the field hospital. Including the various headquarters and detachments a division consisting of about 1200 men would have approximately 100 Medical Officers, 50 non-commissioned officers and 700 privates, the hospital corps representing about six per cent. of the strength of the command, which is two per cent. higher than the other armies. Their organization is well effected, and in the battle of Peitsang, near Tientsin, on August 4, the manner in which the wounded were handled excited the admiration of all who witnessed it.

In the German Army there are six Medical Officers with each regiment, two to each battalion. One non-commissioned officer of the hospital corps is assigned to each company from which men are detailed as stretcher bearers. Each division has a company of litter bearers consisting of six Medical Officers and 100 enlisted men; to this are attached eight ambulances and 72 litters. Each division has six field hospitals of 200 beds each. The division consists of four infantry regiments each numbering 3000 men and such cavalry and artillery as may be assigned to it; the total strength approximates 15,000 officers and men. The personnel of a field hospital is six Medical Officers and 45 enlisted men. This would give a total medical force in a division exclusive of those attached to the staff, cavalry and artillery, of 66 Medical Officers and 428 enlisted men, or about 3.5 of the total strength. When the Base Hospital, Hospital Ships, etc., are considered, the percentage would increase about 4 per cent.

In the French and Italian services the system is very similar, although apparently not so elaborate as either the German or Japanese. The percentage, however, is about the same. In the United States Army the percentage conforms very closely to these figures. All the Foreign armies above enumerated have adopted the system of company bearers. It has certain excellent features, but in our service it has met with disfavor, having been abandoned several years ago. Nevertheless, it is an uncontrollable fact, that in every engagement in which our troops have participated, it has been found necessary to call upon the line for litter bearers, as the number of hospital corps men on the ground was inadequate to perform this duty.

The British system is very similar to that in our army, with the addition thereto of the regularly organized field hospitals. Each of these hospitals has a capacity of 100 beds and the entire personnel and equipment is specified in regulations. It is subdivided into four (4) "sections" identical in personnel and equipment. Every field hospital has a distinguishing number, which number will always accompany all official communications regarding it. The four sections are designated by the letters A, B, C, D. The section is therefore a complete unit, which would correspond to our regimental outfit. The following list shows the personnel of a field hospital for British serving in India:

NUMBER OF SECTIONS	1	2	3	4
Army Medical Staff Officers.....	1	2	3	4
Medical Warrant Officers.....	2	4	6	8
Sergeants, Pack Store.....	1	2	3	8
Orderlies.....	2	4	6	8
Ward Stewards.....	5	10	15	20
Water Carriers.....	2	3	5	6
Ward Sweepers.....	3	5	8	10
Pakhali-bitristi.....	1	2	3	4
Hospital Store Keeper, No. 1.....	1	1	1	1
Hospital Store Keeper, No. 2.....	0	0	1	1
Hospital Store Keeper Assistant.....	1	1	2	2
Tailors.....	1	1	2	2
Head Washerman.....	1	1	1	1
Washermen.....	1	3	5	7
Total.....	24	42	66	84

The British system gives a certain mobility, which is lacking with us. For instance, when the various brigades of British troops were ordered from India to China, the Commanding General in his order merely designated that such and such field hospitals (giving numbers) should accompany the command. This was all that was necessary, and a few words expressed what in our service would have required much previous thought and calculation to effect.

It is not claimed that the Medical Department of the United States Army accomplished more during the China Relief Expedition than during other campaigns in Cuba and the Philippines, but it was the first time that our army has come in friendly contact with those of other nations, which enabled a comparatively accurate comparison as to the relative status and advance of each. This comparison so far as equipment is concerned, was undoubtedly in our favor, and was but another instance of the push and ingenuity of our nation, and too much credit cannot be given to the able members of the Corps, who are responsible for the brilliant result obtained.

The Medical Department, like many other departments of the service, has received its full quota of abuse and criticism, but it should be a source of gratification not only to the Military Surgeons of the country, but to the nation at large to know that we have little to learn from the other great armies and that they would do well to follow in the path our progress has outlined.

# Reprints and Translations,

## AN UMBRELLA SHELTER FOR THE WOUNDED IN ACTION.

By MAJOR VALENTINE MATTHEWS,  
ROYAL ARMY MEDICAL CORPS, VOLS.

AS it not infrequently happens in war that while it is possible to get to the wounded it may not be possible to move them for a considerable time, the contrivance shown in the accompanying diagrams is suggested as a means of providing temporary shelter, while the wounded are lying in the field, to mitigate the suffering caused by exposure to sun and weather.



The Umbrella Shelter—erected.

It is suggested that a certain proportion of stretcher-bearers should carry these umbrellas and put them up over the wounded, after their immediate necessities have been attended to, until they can be carried back to the dressing station or field hospital.

This umbrella shelter consists of a strong umbrella of about the size of an ordinary carriage umbrella, with a metal hook or

handle at the end of the stick, which is thrust like an anchor into the ground, while the umbrella parts rests on the ground on the ends of two of the ribs. To the upper part of the umbrella as it



The Umbrella Shelter—folded.

is pitched is attached an extending curtain or tent, which is fastened into the ground at the other end by a small peg of metal or wood attached to it by a cord, whilst the upper end of the stick is steadied in a similar way. The umbrella and curtain are



The Umbrella Shelter—flap lifted to show interior.

made of khaki-colored material and the curtain is easily detachable, so that the other part can be used as an ordinary umbrella if desired.

The length of the umbrella when folded is about 3 ft. 8 in., the weight about 6 lb., and the diameter at the ribs on the ground about 40 in., providing sufficient breadth to shelter two men.—*British Medical Journal*.

# Medico-Military Index.

## MEDICO-MILITARY ADMINISTRATION.

A new military medical package. *Militaerarzt*, Wien, 1903, xxxvii, 74.  
Military native hospitals. *Indian M. Rec.*, Calcutta, 1902, xxiii, 651 : 1903, xxiv, 50.

**de Alarcon (C. L.)** [The new individual packets for treatment.] *Rev. de san. mil.*, Madrid, 1903, xvii, 1-3.

**Boman (E.)** [View of the changes of the sanitary service of the Swedish army which occurred in consequence on the new organization of the army.] *Tidskr. i mil. Hälsov.*, Stockholm, 1903, xxviii, 1-17.

**Brunner (C.)** [The wounded in the wars of the Old Confederation. History of the field hospital service and army surgery in the Swiss cantons up to the year 1798. Part II. 17th and 18th century.] 8°. Tübingen, 1903.

**Bushuyeff (V. F.)** [Compulsory medical treatment in the Army.] *Russk. Vrach.*, S. Peterb., 1903, ii, 10-13.

**Cramer (L.)** [On the Red Cross and the Samaritan Society in its relation to voluntary assistance in war.] *Schweiz Bl. f. Gsundheitsflg.*, Zürich, 1903, n. f. xviii, 73; 85; 97.

**von Czerlieu (M.)** The lance as the weapon of cavalry. *J. Roy. U. Serv. Inst.*, Lond., 1903, xlvii, 39-47.

**Daae (H.)** [The education of sanitary officers in tactics.] *Norsk. Tidskr. f. Mil. Med.*, Kristiania, 1901-2, vi, 171-178.

**Dahlheim (L.)** [New models of bandages in the Swedish army. *Tidskr. i. mil. Hälsov.*, Stockholm, 1903, xxviii, 20-24.

**Ebert (R. G.)** The medical department of the U. S. Army, *Med. Sentinel*, Portland, Oreg., 1903, xi., 91-99.

**Fein (J.)** [A bandaging and medicine-chest for manœuvres in time of peace.] *Militaerarzt*, Wien, 1903, xxxvii, 49-54.

**Fessler (J.)** [First aid to the wounded in war, with reference to the relation of the Red Cross to the South African campaign.] *Deutsche Aerzte-Ztg.*, Berl., 1903, 4; 32.

**Hathaway (H.)** A mounted bearer company. *Brit. M. J.*, 1901, i, 404.



## Editorial Department.

### THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

WE congratulate the Royal Army Medical Corps upon the fine appearance of its new Journal, the first number of which was issued last month under the title of the *Journal of the Royal Army Medical Corps*. The first number is a handsome octavo of eighty-two pages, introduced with a salutatory by Sir William Taylor, K.C.B., the able and progressive Director General of the British Army Medical Services. The *Journal* appears under the editorship of Major R. H. Firth, well known as one of the authors of Notter and Firth's Military Hygiene. Its contents are to embrace: "(1) Original articles written by officers of the Royal Army Medical Corps and others; (2) Bibliographical Notes on Articles of Importance and Interest to the Military Service; (3) Reprints and Translations from Military Medical and other Journals; (4) Official Gazettes and Official Information generally bearing upon the Army Medical Services." One remark of Sir William Taylor is worthy of application to American military surgeons as well as to those of his own Corps, viz., "There is surely every ground for expecting that the officers of the Corps will not hesitate to support this effort to maintain a high standard of professional and scientific attainment in the Army Medical Services. \* \* \* It is to be hoped and certainly very much to be desired that not one officer will be found in the Corps who does not approve of the objects with which the *Journal* has been founded or who will refuse it his strongest support."

The contents of the first number consists, in addition to "L'Envoi,"—the salutatory by Sir William Taylor,—of four or-

iginal communications, respectively: Hospital Arrangements on Board Transports; A Case of Neurectomy of the Sciatic Nerve; Some Rare Ocular Manifestations of Venereal Disease; and a report on the Medical Relief Expeditions to Martinique and St. Vincent in Aid of the Sufferers from the Volcanic Eruptions of May, 1902,—the latter by Major Will whose work there brought great distinction to him. The editorial consists of a review of the enteric fever problem, and there are several pages of abstracts of current literature. The remainder of the Journal is devoted to Corps news and includes births, marriages, deaths, the transactions of several intra-corps organizations and other notes, among them friendly references to the work of the Association of Military Surgeons of the United States.

The first number of the publication augurs well for the success of this move upon the part of the members of our sister service and we extend to it a most cordial welcome as a most efficient agent in the prosecution of the purposes to the accomplishment of which every conscientious military medical officer in every nation devotes his most earnest effort.

---

#### POISONED WOUNDS BY THE IMPLEMENTS OF WARFARE.

THE "Mutter Lecture" for 1902, delivered by Major Louis A. LaGarde, Surgeon, U. S. Army, before the College of Physicians in Philadelphia last December, had for its subject "Poisoned Wounds by the Implements of Warfare." The lecture opened with an historical account of poisoned wounds in warfare and then showed the influence which the evolution of the firearm has played in our conception of the same. The modern firearm is completely analysed and the possibility of poisoning wounds as of old, determined by experimental investigation. The pathological groundwork of the same is thoroughly discussed, especially in its relation to bacterial infections, and the various etiolog-

ical and predisposing factors vividly portrayed. The result of this experimental work is summed up in his conclusions as follows:

The literature of poisoned wounds gives ample evidence that the custom of poisoning the implements of warfare such as arrow heads, lances and swords, has been practiced from prehistoric times to the present day. From the state of our present knowledge of the potency of certain chemical and bacteriological posions we have reason to believe that the custom mentioned of thus adding to the deadliness of the injuries inflicted in war, in the hunt and in criminal attempts, was undoubtedly successful in a large number of cases. From the description of the poisons used and the sources of the same, it is evident that not only vegetable, but also bacterial poisons were employed, as shown by the experiments of Ledantec.

The transmission of poisons into the wounds by the old implements was easily accomplished. The introduction of firearms in about the fourteenth century threw much doubt on the possibility of still continuing the practices of the ancients.

Although the composition and manufacture of ammunition, with the exception of the wad, rather negative the presence of bacteria in original packages, we must admit that the explosive and the ball are contaminated, as shown by our observations, in 12% and 47%, respectively; and further, that they become contaminated by handling. The wad and wadding materials are always contaminated. There is nothing in the act of firing, either from the heat generated by the explosive, or that due to friction, to destroy bacteria existing in the powder, in the wad, on the ball or in the barrel of a gun; and, when distinct bacteria are placed anywhere in the ammunition, including both black and smokeless powder, or in the barrel before firing. they can be invariably recovered when shot into media, as we were able to prove in our early work with anthrax and as has been more recently demonstrated by others.

The results in the foregoing experiments warranted the

belief that poisoned wounds could be inflicted by firearms when specific pathogenic bacteria were placed in the ammunition or in the barrel, and, as a matter of fact, in 1892 we demonstrated this with anthrax placed on bullets, and again, in 1895, when the organism was placed in either smokeless or black gunpowder. With the exception of infecting the powder, the experiments referred to by us have been confirmed and elaborated by Dorst, Probst, Strick and others working with various bacteria. Taking tetanus as the ideal organism with which a wound may be poisoned, we have seen in our later experiments that the organism can be transmitted into animals with fatal results when it is placed at any point from the powder to the point of impact on the skin. It follows from the work of the different observers that all forms of bacterial life can be transmitted by portable firearms, and that gunshot wounds can be infected or poisoned when virulent pathogenic organisms are designedly employed. We should bear in mind, however, that when a gunshot wound is found to be primarily infected, the infection may have come from other sources than those mentioned in the ammunition or barrel, because infected clothing or skin may be carried into the wound by a sterile missile.

Aside from the role that is played by the resistance of the individual and the virulence of the organism in the infection of wounds, the character of the lesion, so far as this relates to the local resistance, is of prime importance. We know now that hematomata confer a special predisposition to infection, and as the lesion of a gunshot wound often partakes of the nature of a hematoma, in addition to lacerations and other injuries leading to a condition of necrosis, we must regard the wounds from firearms, everything considered, at least as susceptible of infection as hematomata, and Strick's experimental work goes to show that they are even more so. We have shown also that necrosis caused by burning is an additional predisposing factor in wound infection, and one that we may consider with propriety in toy pistol tetanus, as well as the tetanus from powder burn occurring with other weapons, when the shot is received at contact or thereabouts.

Concerning the possibility of transmitting vegetable poisons into wounds, if we take curare and ricin as examples of such poisons we find that there is nothing in the act of firing to destroy their lethal properties, and that they are readily conveyed into wounds when placed in the powder, on the ball or in the barrel. Toxins and animal poisons, like snake venom, can undoubtedly be conveyed in the same manner.

Finally, we have to conclude that all forms of bacterial life and animal and vegetable poisons may be conveyed into wounds made by firearms, and that the clinical evidence of poison in the case of bacteria depends on the variation of the factors already mentioned. The clinical evidence of vegetable poisons, on the other hand, is not so dependent on the amount of the lesion; in fact, our experiments show that clean incised wounds absorb the poison more readily than other wounds, and that death is more rapid.

The lecturer next takes up the clinical evidence of poisoned wounds as they occur today and shows how common they are both in civil and military practice. Taking tetanus as an example, the wounds infected by that form of bacterial poison are met with frequently in civil life as a result of accidental injuries by the toy pistol, and in military life in all the wars, and also in military maneuvers as a result of blank cartridge wounds. The etiological factors of burning and the peculiar lesion of gunshot wounds are especially dwelt upon and the role that each plays in infected or poisoned wounds proved experimentally. The medico-legal aspect of the subject is taken up and the possibility of the recent advances in toxicology of wounds being made use of by anarchists, etc. with criminal intent is emphasized.

This lecture which forms one of the most valuable articles of recent years, not only from a scientific but also from a medico-legal point of view, closes by pointing out the duties of the surgeon in suspected criminal attempts as follows:

He should make a thorough examination of the ammunition and weapon. This should include a bacteriologic and chemical study of the powder, the bullet and the barrel as follows:

1. If powder grains are found in the clothing or wound they should be carefully collected for examination.

2. The projectile inflicting the wound when recovered should be at once dropped into media with sterile forceps.

3. If the wound has been the result of a ricochet shot, the point of impact before penetrating the skin should be examined for the presence of poison.

4. The inside of the barrel of the weapon should be examined for specific micro-organisms.

5. The examination should also include a thorough study of all the ammunition remaining in the weapon.

6. The same steps should be observed in examinations for the presence of toxins, and animal and vegetable poisons. In this connection the following passage from the Huxley Lecture by Welch describes the method of identification: "The only certain means of detecting toxins of the class of diphtheria or tetanus toxin, snake venom and certain vegetable poisons of the same category is their neutralisation by the corresponding antitoxic sera. Occasion may arise where such detection is of practical and even medico-legal importance, as has been exemplified in India, where the criminal use of cobra venom is not unknown."

When the evidence of poisoning has been shown, the prosecution should endeavor to establish the absence of the poison found: 1, on the instruments; 2, the dressings; 3, the hands of the attendants; 4, the clothing and 5, the skin of the patient. This part of the evidence can be readily gathered if the surgeon in charge is on the alert and acts at once. In all the examinations for bacteria special attention should be paid to the identification of strict anaerobes by animal experimentation as well as by culture methods.

THE ACTING ASSISTANT SURGEON OF THE ARMY  
OF THE UNITED STATES.

BY MAJOR AZEL AMES,

WAKEFIELD, MASS.,

BRIGADE SURGEON OF UNITED STATES VOLUNTEERS.

I AM to speak of the strangest anomaly known to our military professional life, viz:—of him who is a military officer of the highest responsibilities—when it conveniences the Government to have him such—but who is at all other times a civilian of no military *status* whatever; of that citizen of the Republic who, called to the field with its forces, becomes a soldier in everything but in name and just appreciation; who has been a figure in the life of the American Army of the last half century, conspicuous for devotion, skill, daring, resource, sacrifice and achievement—whom history will delight to honor,—*the Acting Assistant Surgeon of the Army of the United States.*

By this title he has been best known to the law and his comrades and to men of courtesy everywhere, for more than fifty years; no good reason has ever been given for any other (except that he has often been *principal* instead of "Assistant") and all true men can have only regret for the spirit, which, in spite of his record and his worth, seeks to degrade the man and belittle his service by the offensive designation of "contract surgeon."

For this, my sole utterance of the hateful and dishonoring term, I make my most reverent apology to the memories of Hickborn, Osborne, Fahnestock, Movers and Danforth,—dead on the field of battle; to Lazear and Fabricius,—dead on the field of science; to Kittredge, Boon, Huse and Hatch,—wounded in action; to Guiteras, Delgado, Lund, Marshall, Johnstone and their comrades, whose heroic service has wrung recognition "in orders" from the head of the Army,—a recognition due to many more.

Coming first into the field as an auxiliary from civil life, to his over-burdened professional brother-in-arms, during the brief but hot campaigning of the Mexican War, in August, 1846, the advent of the Acting Assistant Surgeon then, and his reappearances in later wars and upon the frontier, have been always those of a welcome ally in time of stress, and hence in the character of "a friend indeed."

In the Mexican war there were but a handful; in the Civil War there were 5532; in the Spanish war, 855. Some hundreds have served in the Philippines, while a few score have worthily upheld the honor of the name in hard service along the borders.

Except with a few doing duty with the Army on its "peace-footing,"—which has often meant trying service and death in Indian campaigns—the tenure of the Acting Assistant Surgeon (liable to be abruptly terminated by "order" at any moment), has rarely exceeded two or three years, but has usually been just long enough to utterly demoralize, if it did not destroy, his lucrative civil practice, frequently hurriedly left to its own devices, when the call of the government came.

Hence, save for the experience gained, the Acting Assistant Surgeon has, with rare exceptions, reaped a heavy loss by his patriotic tour of service with the troops, of which his commissioned brother of the Regular Army knows nothing, and for which, when experienced, he of the volunteer contingent, has many present and enduring compensations.

The *status* and relation of the Acting Assistant Surgeon were, in his earlier years, so far as defined or indicated by the Acts of Congress, Army Regulations, etc., exceedingly nebulous and vague, nor can it truthfully be said that later legislation, conflicting "orders" and decisions, or the train of events, have done much to clarify or improve either, despite many sound, and some unwise, efforts to do both.

Designated repeatedly, however, since 1861, by Acts of Congress, Army Regulations, and "Orders" of the War Department of "*of* the United States Army" and as "Acting" in the capacity of an "Assistant Surgeon" of that Army, his duty, authority prerogatives, responsibility, accountability, pay and pension have



been. and are, those of an *officer*. Yet, Congress, the War Department, the accounting officers of the Treasury and the Veteran Military "Orders" refuse or fail to recognize him as such, though the Attorney General of the United States and a Justice of the United States Supreme Court have both declared his service to be distinctly "military" and both Comptroller of the Treasury and Paymaster General of the Army, have declared him "*a quasi officer*". All are agreed that he is not an enlisted man. He remains, therefore, *in law* and the tenets of the government, despite the overwhelming volume of *prima facie* evidence as to the *fact*, a *civilian* pure and simple, a *commodity*, as it were, contracted for at such a price for the Army's use, like beef or quinine.

But, it is fair to ask, what other "*civilian*" was ever so formally—if not technically—"mustered" and "discharged"; has ever worn by "order" of the War Department, in two wars, the prescribed uniform of an officer of the United States Army: has been placed in authority over its officers and men, (without objection on their part); has had supreme charge of its hospitals, stores, ships, and transportation; has receipted for and expended millions of dollars in money and supplies; has been given (as only officers and guards are supposed to be), the countersign and parole in time of war; has sat upon boards of survey and inquiry, upon commissions, and even upon courts-martial, *or has received a pension for military service?*

The Acting Assistant Surgeon—civilian though he be—has indeed shared equally with his commissioned brother-surgeons:—

(a) The same dangers of disease, wounds, capture, imprisonment, hardship and death, whether in camp or hospital, on the march or on the field of battle;

(b) The same amenability in time of war, to military discipline, regulations, courts-martial and punishment;

(c) The same responsibility for due knowledge and observance of the articles and laws of war, of quarantine law, international comity, and "Treaty" or "Convention" obligations, and

(d) The same responsibility and accountability for the men, and the property of every kind, committed to his care, both afloat

and ashore; for the correct and competent conduct—both professional and administrative—of post, field and general hospitals, convalescent camps, transports, trains and hospital ships, and for the satisfactory organization and administration of large sanitary undertakings.

In fact, all the things enumerated, and many others, it is, in the field, not only daily desirable, but often indeed imperative, that the Acting Assistant Surgeon *shall* undertake and perform, *solely for the interest of the Government*, as the only available officer at hand. Not infrequently it has been to his own serious loss and damage.

Persistent inquiry among military authorities of rank and experience, has failed to develop a single respectable reason for the continued existence of this absurd anomaly, this unparalleled combination, of a *de facto* officer and a *de jure* civilian, in the same individual, in the Army establishment of the United States.

To those only who know his record, his worth and his work, are the wrong and inequity done him, fully apparent. The following are but some of the harshest of these injustices:—

1. He is not given even the poor allowances stipulated in his contract, Army Regulations, and the promises of the Surgeon General when his contract was made. There is hardly one of the Acting Assistant Surgeons of the Spanish War, who is not "out of pocket" today, by the failure of the Government to make good its promises to him:

2. He cannot count upon any definite tenure of office,—no matter how distinguished or valuable he, or his service, may have been, his contract may be annulled, at any moment, for no better reason than the jealousy, caprice or whim of an angry, or even drunken Chief Surgeon, regardless of the hardship it involves or the sacrifices made. If the Chief Surgeon who annuls the contract sees fit to indorse upon it (however falsely) that it is annulled "for misconduct" or "neglect of duty", his travel allowances are cut off, and he may thereby be left stranded in farthest Alaska or the Philippines, to get home as best he can—and, worst of all, he has no appeal or remedy;

3. He, alone, of all, who performed military service, during

the Spanish War, has been refused by Congress, the extra compensation granted even to an enlisted man of only a few weeks' service. Although the merit of his service has been universally admitted and the United States Senate adopted amendments giving him this gratuity, it was stricken out of the Act, to the lasting shame and disgrace of those responsible;

4. He reaps none of the rewards of valiant or exceptional service, readily accorded for conspicuous merit, to those who served with him. He is not in line of promotion, he cannot receive brevet rank, or a medal of honor (even though specially recommended therefor) or the thanks of Congress, or be placed on the retired list if disabled. Those who shared with him some especially glorious or beneficent achievement, may receive these rewards, but *he* is debarred therefrom;

5. He can make no claim, as of right, upon the Quartermasters' or Commissary Departments, for the conveniences accorded both commissioned officers and enlisted men, beyond the beggarly limitations of his contract and the few allowances of the War Department "orders";

6. He cannot, even when ordered to field duty with mounted troops, demand a Government mount, or, if furnishing his own horse and equipment, demand forage or farrier service, as of right; tho' the commissioned Assistant Surgeon, who rides at his side may claim both;

7. If stricken down on the field of battle, or by disease—as has often occurred—he has no legal claim, and there is no provision for his care when dying, or his treatment or support while lying disabled by wounds or disease. His payment immediately stops, and his *Country* makes no provision for feeding or sheltering him, or giving him medical attendance. Nor is he, in law, entitled to transportation to any other place, or to his home—except upon annulment of his contract;

8. There is, indeed, no provision even for his burial, or for sending home his body. In fact, shot down on the field, though in heroic and self-forgetful devotion to his duty, or falling from self-sacrificing devotion, or disease, in hospital work, so far as his contract rights go—which the Accounting officers tell us are

all that he has—he must be left like a disabled horse, to draw his last breath and moulder where he falls. The very private he was bringing out of the fight on his back when the same shot killed both, is entitled to burial at his Country's expense and "with the honors of war", but the hero who died in trying to save him, can legally claim neither, and though the Quartermaster and his brother officers rise superior to law, and bury him in a Government coffin at Government expense, with the flag and a soldiers' volleys over him, a hypercritical accounting officer might disallow the items, unless vouched by a *de jure* officer, as "necessary for the public service" on sanitary grounds;

9. He is not eligible,—having been officially declared not an officer, nor yet an enlisted man,—to the Veteran Military organizations, such as the Grand Army of the Republic, the Loyal Legion, etc., or to certain Patriotic Societies which require that he shall have been one or the other to attain membership. And so the injustice of his Government actually follows him back into civil life, notwithstanding his service to it has been most distinguished and valuable.

All honor to this Association and to its honored Secretary,—upon whose initiative it acted,—that, setting a high example for others, *it amended its constitution* and became the first Veteran organization (except his own) to take him into full fellowship;

10. He cannot receive,—though his service in field or hospital be well known,—the grateful provision made by the city or State, whose service he left to go to the front, of his former position, or the payment of salary while absent, available to those who became officers or soldiers on the Nation's call. The Government he served declares him *neither*. His patriotism and service *have become a stigma*. That he was in the service is well known in his community, but he does not reap the benefits enjoyed by those who served with him, and the suspicion is aroused that his record is not honorable;

11. He is again discriminated against, in the matter of pensions. Though allowed by Congress the same pension for disability contracted in the service, as are all other First Lieutenants, he is not granted his pension as all others have been, for an age,

or other disability under the Act of 1890. It is one of the inscrutable things of the pension law—whose name is legion—that he should be eligible with the rest, in the one case, and *not* like them in the other;

12. He cannot enjoy the preference given under the Civil Service Laws, to Veterans, for here again, the Government decides that, though "he is a quasi officer" and "performed military service", *he is not a soldier* (!!); and lastly:—

13. He is not admitted to the National Soldiers' Homes, though permitted burial as a soldier in National Military Cemeteries. A most unholy discrimination, against which every sentiment of justice and honor revolts!

It is obvious that the prime cause of all these hardships of the Acting Assistant Surgeon *is lack of commissioned rank!*

Though it is true that some of his lesser wrongs might be remedied by other means, the chief of them, *could not*; while *all* of them would be instantly corrected, and the Government also be greatly advantaged, by making him a commissioned officer.

No valid objections have ever been urged against it. It is admitted that it would accomplish what is claimed. Those high in authority and competent to judge, concede that the Government has everything to gain thereby, and little, if anything, to lose. The pay would be no more than now, the pension the same. The additional emoluments would be so few as to be of little account, while the efficiency of the officer and the *morale* of the service would be greatly increased. It would, moreover, be but simple justice to a self-sacrificing and devoted body of *de facto* officers which the Nation cannot afford to disregard. The older—and many of the younger—General officers of the Army and a large part of the most experienced officers of the Medical Staff are known to approve this action, while some of them have strongly urged it.

But neither the proposition to commission him, nor the facts favoring it are new. Repeated attempts have been made to apply the remedy and get justice for him in this way, yet, hitherto without success.

Long recognized as a "quasi officer" of definite allied rank, successive efforts have been made for more than forty years to obtain the necessary action of Congress to confirm him in that rank, even for the last day of his service only, or even after he had left the Army, the Government being expressly safe-guarded against further involvements thereby. All have alike signally failed.

So remarkable an attitude, perpetuating as it has for so many years, without apparent reason, such evident injustice, ingratitude and inconsistency, evokes and makes pertinent the query:—

*Why?*

It is, in part, the purpose and endeavor of this paper, with entire candor, but without feeling, to somewhat explicitly answer and to point out, so far as possible, where the responsibility lies.

The principal causes of the defeat hitherto of the relief legislation proposed, have been:—

(a) The lack of effective, organized support from the medical profession of the country at large, and the feeble organization and numbers of those actively engaged in pressing these measures upon Congress:

(b) The jealousies of the officers of both line and staff, including some few of the most influential members of the Medical Staff of the Army, apprehensive of *any* action which might tend in the least, to lessen their importance or exclusiveness, or impair their chances of advancement. To its credit be it said, the greater portion of the Medical Staff has never exhibited this unfriendliness, but *per contra*, has cordially endorsed the claims of its fellow workers:

(c) The persistent official opposition of the offices of the Surgeon General and Secretary of War, *always* most potent in hostility to the proposed legislation:—and—

(d) The undue, almost controlling, influence given by Congress to its Committees and their reports—and the aid this gives to the official jealousies and antagonisms mentioned. These Committees are dominated largely, as is well known, by their chairmen, often men whom age, long service and official inertia have made devotees of "precedent" and "the regular order,"

who see in proposed changes only crafty designs, and who have come, from the interested and adroit court paid them by Department and Bureau heads, to accept nothing—hardly to tolerate anything—not proposed, or at least, approved, by these Department managers.

It is safe to say that, never, until very recently, has any Bill granting a commission of equitable rights to an Acting Assistant Surgeon, received the sanction of a Surgeon General or Secretary of War,—and then once only and for future time, and under irresistible stress of circumstances.

It is hence plain that the responsibility for the grave wrongs described and the failure to remedy them, rests *primarily*, with that officer of the War Department whose express duty it is to secure to the Medical Corps of the Army, under his charge, the utmost possible efficiency, and to each of its factors exact equity.

Congress depends, as we have seen, upon its Committees for guidance; the Committees upon the Department heads; they upon their Bureau chiefs, and the close-linked chain of influence is complete;—the Legislative Branch of the Government being practically controlled by the Executive, and taking its instructions, not from the People, or giving ear to those who must appeal to it for relief and have a right to be heard, but those whose proper duty it is to execute such laws as Congress shall pass—but who, alas! have favors to give, in return, for favors received.

With Congress lies then, the second measure of responsibility for the gross injustice of 40 years to the Acting Assistant Surgeon. In view of its own obduracy and inconsistency, it would hold *first* place, if it were not the express *duty* of the Surgeon General, to take the initiative in securing all things needful for the welfare of his Corps, and to obtain for them, if possible, the urgent support, with Congress, of the Secretary of War, whose function is often purely ministerial.

The remaining measure of responsibility (*and it is a large one*,) rests with the Medical profession, the Medical Colleges, the Medical Associations and the Medical Press of the country;—in short, upon the organic, moulding, promoting and conserving influences of medical science and art in the Nation,—for their long neglect of interests so peculiarly their own, and of such vital

importance to the whole. The united influence of these bodies, duly organized and exerted, is concededly equal to the accomplishment of almost any desired and laudable object toward which it is directed,—with Congress, or elsewhere.

It is true that the active interest and aid of this great influence has never been invoked in his behalf, by the Acting Assistant Surgeon, except in the most ephemeral way. *Nor should it have been necessary to bespeak it!*

I have roughly sketched—with nothing of the historical features, or the illumination afforded by men or events, in which they are rich,—an outline of the service, the relations, the rights; the wrongs, and the responsibilities therefor, of the Acting Assistant Surgeon.

A word as to the amends, he, of past service, and as to the better usage, he of the future should receive, and I am done.

No words are strong enough to express the contempt every brave and true man must feel for the recent action of the War Department in making, without excuse, his most offensive and belittling designation, his official title; and in removing the rank insignia from the uniform he has worn with honor,—even unto death,—in two wars.\*

If the insignia belongs only with commissioned rank—though it is strangely late in the day to find it out—then, in the name of Justice, Decency, Gratitude and Honor, *confer that rank*, instead of degrading the man!

If the existence of a "contract" involves a dishonoring designation, *abolish the superannuated "contract"* and replace it with the commission so rightfully his!

It is almost impossible to understand how any officer with *self-respect*, could suggest such indignities to such men, or how

\*The ruling of Gen. Geo. B. Davis, Judge Advocate General of the Army,—made since this paper was written—that a "contract surgeon" not being an officer of the Army, but a civilian employee only, is not authorized to issue orders to enlisted men—even of the Hospital Corps—is but the logical and inevitable sequence of the absurd and anomalous conditions pointed out in this paper. It carries with it however, such utter degradation of the Acting Assistant Surgeon and such total destruction of his usefulness in the Army under a "contract" that it ends beyond doubt, the contract system as alike worthless to the Government and impossible to any self-respecting man. As the Army must have this temporary medical adjutant at least in time of war—this ruling is certainly the master-stroke toward making the Acting Assistant Surgeon a commissioned officer.



professional men *worthy of the name*, can be found to submit to them.

That they and the great profession they represent, have so long endured such inequity without the remedial resentment which it is theirs to potentially exercise at pleasure, is the sole argument of weight against their entitlement to the commissions claimed for them.

Let it be made a matter of ethics and honor, of professional pride and personal obligation by the members of the Medical profession in the United States—vigorously insisted upon by every Medical College, Journal, and Association—that no medical service with the Army, Navy or Marine Hospital Corps, shall be accepted by any member, *except under a commission and equitable conditions*, and prompt acquiescence with this most just demand will follow on the part of Congress and the War Department.

Due regard for its own dignity and importance; for its hard-earned entitlements and its interests,—now assailed with impunity, from lack of cohesion and unity, by “Christian Scientists (?)” “Osteopaths”, etc., on every hand,—imperatively demand this of the legitimate Medical profession.

If it is to retain the rightful prestige and the position in the public service it has held, and to which sound education, integrity, long service and great sacrifice entitle it; if it is to secure the maintenance of high standards and scientific truth for the future, its membership must stand together and *insist* that when it lends its sons to the military service of the Country, it shall be under conditions alike just and honorable to both.

The Acting Assistant Surgeon has come to stay. For a brief period he went out of existence only to become, at the outbreak of the Spanish War, the chief medical reliance of the Army. He will again, in all human probability, assume that relation in the next emergency, but it should be *only* under new and better conditions righteously his—as an *officer, in law* as well as *in fact*.

It is because nothing less than this would be either wise or right, either to the Government or himself, that I have not considered suggestions to simply lessen his hardships or give more acceptable title to his paradoxical position. It is not a new *name*

only but a new *status* that he needs! Every concession he makes to offers of less than due commissioned rank, for his temporary service but weakens his impregnable position and retards his ultimate sure success.

The considerable recent increase of the Regular Medical Staff, which has permitted his temporary relegation to lessened consideration and even to recent contumely, will again fall off, with the inevitable reaction against a large Army and large Staff Corps which always comes,—sooner or later,—in a Republic after war. The pacification of the Philippines and the creation there of a strong Insular Constabulary, ultimately and inevitably means such reduction. This having come, the civil surgeon must again be the reliance for extra medical officers, as he *always* has been and must be, in any exigencies like those of the Civil or Spanish Wars.

Every failure of effort to do him justice in the past has had its *animus* and chief cause in the ambition of the War Department chiefs to build up the permanent strength and importance of their Corps—a laudable ambition when justly followed—a weak place in their armor against the determined assaults of a righteous cause.

Hitherto the appeals of the Surgeon Generals of the Army to the patriotism and *esprit de corps* of the medical profession in civil life, in times of need, have met with a fairly prompt response.

I venture to believe that,—except from considerations of humanity only, in case of brief and dire need after great battles, or in pressing exigencies,—a similar response to like appeals, *under the same conditions*, will never be made. *Nor ought it to be*, in justice either to the profession, the Government or those called upon.

Patriotism will be but little abated; the fervor of young and old, for the battle front, will not materially lessen, but just as in the great fields of industry, organization and its *equitable* demands upon close and selfish corporations become in time irresistible, so the closer organization and reiterated equitable demands of the Medical Profession will compel due recognition for its representatives, at the hands of Congress, against the mistaken self-

concentered policy of Bureau Officers, or other unfriendly influences.

"The mills of the gods grind slowly  
But they *grind*."——

That this Association will take a leading part in the good work of securing complete equity to its fellows,—in whose behalf it was so honorably the first to break the ban of the Veteran organizations,—I entertain no doubt.

In the words of that grand friend of humanity and of all good—Dr. Edward Everett Hale,

"We *must* because we *ought*, and  
We *ought* because we *can*."

#### FRACTURE OF THE METATARSUS THE RESULT OF MARCHING.

THE accident is more common than is generally supposed. Swellings of the dorsum of the foot which are put down to periostitis are not infrequently really fractures of the metatarsus. It generally happens during the first year of military service, either as the result of ordinary marching in full equipment or from jumping or running; it is more likely to occur if the foot is unduly arched. Of the author's cases, six happened during marching, three in jumping, and three in running. Tripping against a stone or over a gully are common exciting causes. Fracture takes place chiefly in the second metatarsal at the junction of the anterior and middle third. Probably the second is more often fractured because it is longer and more slender than the other metatarsal bones; it is also more firmly fixed at the base, and by a transverse rather than an oblique articulation. The symptoms are pain in the dorsum of the foot (which, however, does not prevent walking), followed two or three hours later by swelling and inability to walk. Ecchymosis of the phalanx is a later and important sign. Crepitation and increased mobility may be made out, and of course radiography is useful if it is available, but it is quite possible to make the diagnosis without that. If recognized and adequately treated by rest in bed, the foot gets well in two or three weeks. In view of these cases it may be well to remember that a high arch may be as bad for the young soldier as flat foot.—*Il Policlinico*.

## AMBULANCE FOR MOUNTED TROOPS.

By LIEUTENANT COLONEL H. G. HATHAWAY, R.A.M.C.,  
MEDICAL OFFICER, IN CHARGE OF CAVALRY DIVISION STAFF  
DURING THE SOUTH AFRICAN CAMPAIGN OF 1899-1900.

**A**N extensive campaign following on a prolonged period of peace, tests the value of the equipment and training of all branches, and to none are the object lessons produced of more value than to the medical services.



Saddle Support for the Disabled. Front View.

Antiseptic surgery, and rifles of small calibre, have enormously enhanced the possibilities not only of healing our wounded but of returning them to the fighting line after the shortest possible interval, with much economy of men and money to the State. The terrible results of septic fevers and such like sequelae so calamitous in former campaigns are now, principally on account of antiseptic surgery, at an end.

There is then little to improve in military surgery pure and simple, but to tend the wounded

in active service, forms only a small, though important part of an army surgeon's duties, for, as the campaign is prolonged the sick outnumber the wounded. Medical authorities have long ago recognized the urgent necessity of proper sanitary precautions to prevent disease being adopted from the very commencement of any campaign. A wounded soldier, with grit, returns to his unit, often without touching the base of operations, but a man seriously sick is invalided, or is buried. The spirit of economy should alone dictate the free use of sanitary precaution to prevent this total loss to the campaign of trained men: they have all been fed and clothed, and transported to the scene of operations, and may have had some experience of campaigning before they were invalided, and



Saddle Support for the Disabled. Rear View.

replaced by fresh hands, therefore the most expensive arrangements that could be devised for the army for boiling and carrying drinking water enough for everybody, for protecting food from contamination on the march and in camp, and for the disposal of excreta could never balance the account expended for invaliding for preventable diseases.

It has also been recognized that if we have large numbers of sick and wounded, we require consequently, large numbers of skilled nurses.

Experience in ambulance arrangements has developed use of hospital railway trains, and hospital ships have been perfected. Extensive battle fields have been cleared of wounded in a commendably short space of time, by stretcher bearers, but one other form of ambulance is required, that for mounted troops, and with this general premise I will proceed to the main subject of this paper.

My maxim is that like must go with like. Mounted troops require wheeled ambulance transport, and it must be able to proceed, when not loaded up, as quickly as the corps to which it is assigned for duty, for there can be no point in making ambulance arrangements for a corps, if a trot will separate it from its bearer company. And, in the daily efforts made by slow moving wagons, to keep the touch with mounted corps, the draught animals can never remain efficient in their overstrain, and short time for feeding. Another form of ambulance is required: it must be able to do its work, efficiently, without losing touch with mounted corps, and without destroying its animals: therefore it must be strongly horsed and there must be plenty of spare animals to put in the shafts. The ambulance has to proceed quickly, when empty wagoned, so nobody must be on foot, and for the men to do their work efficiently they must be mounted for they often have to work far into the night, and this cannot be done after marching many miles on foot, after cavalry, in addition to performing duties all day. Not only should the transport be within touch ready to take up sick and wounded, but after the necessary delay which occurs in looking to dressings, treating sick, and loading them in wagons, there is often much ground to make up in order to regain the corps to which the ambulance belongs, and which may require its services. When cavalry are moving some distance and are spread over a wide front, the ordinary bearer company attached to a cavalry brigade is often out-distanced from the beginning of the

day. A mobile mounted bearer company would be with its wounded quickly; this would release fighting men who remain with their wounded comrades, or who ride about in search of the bearer company, and it would obviate need of teaming the wounded lying about on the ground for a prolonged time: for there would be more time to succour the wounded over a wide range. Again there would be less need for those improvised ambulances contrived out of gun limbers and other unstable means, which it is sometimes necessary to call in aid, in order to prevent abandonment. In a good climate, in fine weather there is no necessity as a rule to place wounded men at once in ambulance wagons, for if they have had their wounds dressed by regimental medical units, and have received necessary treatment, they suffer no ill effects or hardships by remaining on the ground for a time: indeed some cases may benefit by the rest, but when mounted troops are moving, their sick and wounded must usually be disposed of rapidly, otherwise the general advance will be checked to admit of the ambulance keeping in touch. Different conditions of warfare and the varied nature of the country to be operated on, necessitate that there should be varied forms of ambulance transport, even in a single campaign.

Nobody with experience of active service would advocate that stretcher or wheeled transport should be taken up to the firing line: this is quite unnecessary the groups round wounded if not actually forming targets to the enemy, assist in locating disposition of troops. Moreover this rapid removal of wounded under fire is quite unnecessary. It is the privilege of the surgeons and drivers with corps, to render first aid, and to, if possible, place wounded under shelter. This applies more to the infantry. Cavalry out on patrol, or in small parties, have often the greatest difficulty in withdrawing their wounded. The majority of these could be taken away if well supported in their own saddles. I have invented a very simple apparatus, (Fig. 1) which has stood a very severe test, and answers requirements admirably. It is simple, inexpensive, fits all military saddles, without any alterations,

makes a saddle feel like a comfortable arm chair, and will prevent an unconscious man from falling from his saddle when his horse is galloping. A semi-circle of light metal, padded inside, and leather covered, has two large Ds at front extremities and a metal, leather covered, upright fixed at right angles to middle of semi-circle behind.

The sick or wounded whose condition permits them to ride use saddle supports, on their own horses. The more severe cases, who are not fit enough to ride, or who have lost their horses, by wounds or otherwise, are given sitting accommodation in the cart about to be described. If unable to sit up they lie on stretchers in the cart.

I have invented a light platform cart for ambulance use with mounted troops. It is on strong springs, over four wheels. The sides of cart hinge down, and with cushioned seats that let down from middle of platform, form comfortable sitting accommodations for four cases on each side, Irish car fashion. A double awning cover is supported on uprights in center of platform. This arrangement allows stretchers to be hooked from the sides of the cart without any obstruction; the sides of cart and the seats are hinged up when stretcher cases are carried.

It will thus be seen that the cart is constructed to carry eight sitting cases, four on each side, or two lying down cases on stretchers, or a lying down case on stretcher and four sitting cases. When stretchers are loaded in cart they are locked by the handles. When not in use the stretchers are rolled up and carried between the turned up seats in middle of the cart. Lockers underneath the platform carry necessary equipment. Lying down cases can readily be examined and attended to from the sides of cart let down, without shifting the stretchers. The detachments of the carts are formed of five men including one non-commissioned officer taken from each squadron of Cavalry. They must all have been carefully instructed in first aid to wounded in accordance with regulations. A single cart with its detachments from the peace footing establishment for a squadron of cavalry, but when mobiliza-



tion for war takes place, a similar cart detachment is in addition drawn from each squadron, and is grouped with detachments from other squadrons and regiments to form the Mounted Bearer Company of Cavalry Brigade, the whole under selected medical officers each of whom has a sergeant of the R.A.M.C. doing duty with him, who looks after the medical and surgical equipment and takes directions as to patient's diet, etc. The horses of the detachments must all be broken to double harness for they draw the cart in pairs. One pair of horses would be in yoke, and another pair brought along by one man of the mounted detachment and the fifth man would ride in the cart and attend to the occupants. If the cart were full up he would ride one of the spare horses, five horses being allowed for each cart and detachment of five men. It is unnecessary to have mounted bearer companies established in peace times, for they are only groups of cart detachments, so the only necessity is to keep sufficient number of men in each squadron of cavalry for two such cart detachments, always thoroughly instructed in first aid to wounded; beyond this, and being able to ride, nothing more is expected of them except that they may, in uncivilized warfare, protect the wounded under their charge. They hand their patients over to the Field Hospitals for nursing at first opportunity, and for this reason it is unnecessary to employ men specially enlisted for hospital work. The strength of regiments must be increased to supply sufficient number of men for ambulance work, if it is considered that too large a number of fighting men are withdrawn for this purpose. Employment would often be given to good men who after enlistment were found not capable of shooting straight.

The requirements of a cart with detachment may thus be summarized:

1. *Establishment.* Medical officers, with one cart nil; with four carts one medical officer. R.A.M.C. non-commissioned officers,—one with each cart. Mounted orderlies drawn from cavalry regiment—five.

2. *Transport.* Special ambulance carts, as described

above. Horses, six for the cart and one for N. C. O., R.A.M.C. The personal transport for establishment would remain with the wheeled transport of the cavalry brigade.

3. *Equipment.* Orderlies would carry surgical haversacks, belts for compressed drugs, canvas water bags (to be boiled frequently).

On the cart would be carried two stretchers of a rigid pattern. A water tank made of aluminum with detachable felt cover, to contain two gallons. Medical comforts in locker, such as brandy, arrowroot, essence of mutton, tinned milk, enamel feeding cups, Etna stove, methylated spirit, carriage candles, surgical necessities, wire splints of various sizes, cane jointed do., triangular bandages, sal alembroth woven do., gauze and wool; iodoform, boracic acid, tally books, plaster of paris in tins, safety pins, steel scissors, stethoscope, extra blankets strapped on seat, carriage lamps for cart also to be used for operations.

On the horses: drivers, hames, one set of traces remaining on cart, another spare set carried under cart. Surgical operating bag on saddle of N. C. O., R.A.M.C., one for a cart.

#### NON-FATAL SPEAR WOUND OF THE HEART.

A SOUDANESE received, (Capt. T. McArdle, R.A.M.C.) a barbed spear wound of the chest which upon exposure of the thoracic contents, was found to involve the wall of the left ventricle, without entering the ventricular cavity but passing through the convexity of the wall so as to separate a strap of cardiac tissue. The muscular strap was then divided and the wound plugged with a sponge, followed by entire and rapid recovery.—*Journal of the Royal Army Medical Corps.*

## SOME OBSERVATIONS WHILE IN THE PHILIPPINES.

By JOSEPH ALFRED GUTHRIE, M.D.,  
SURGEON IN THE UNITED STATES NAVY.

**F**EW are they when entering upon their maiden visit to the Philippines, but do not see the air, water, soil, the whole earth with its many sundry incumbrances, (living and dead)—in fact, everything one sees, he believes to be reeking in germs. I do not except the medical man entirely, in this initiatory impression, because I have heard one or two of them make some startling statements, tending toward this conclusion. Such ideas, however, last but a short time with the common sense practitioner, for he soon settles down and ferrets out the real etiology of disease, and the weaknesses, from a sanitary standpoint, abounding within these, our new possessions. Not so with his lay brother, who has contracted along with his "philippinitis," "germania." He thinks the islands full of germs, and tells everyone so. Once I asked an acquaintance, why he objected to a certain brand-new house located in Cavite, to which he replied that he knew it was "full of germs." I enquired his reason for such an assertion, whereupon he vociferously responded, "Why I saw a cockroach in the house over an inch long."

The microscope is a good diagnostician, in some cases, and in some hands, but when a caddy egotist takes hold of one, it is time for the laity to watch out for him; as much so as they would an inexperienced boy handling a shot gun. There is yet another sort, a professional, who instills into the minds of men a mistaken caution regarding germs; he is of a more intelligent grade, and consequently more dangerous to humanity—especially those poor unfortunates doomed

to live in the Philippines and now battling against the heat of the tropics. These alarmists are responsible for such as my cockroach friend. They are in a large percentage of cases, seeking notoriety with a microscope. He carries it under his arm, as it were, and never ceases to talk of it, telling John or Jim all about his new discoveries with it, and naively explaining its working to his professional friends—just as though one never saw a microscope or lens before in his life. We meet him, even out here in the Philippines, spectacling into the remote corners of these islands of ours, advocating a thousand new methods as to how the "X" bug may be destroyed, etc., etc. So entirely dissimilar is the strenuous surgeon and physician, with rolled sleeve and bared arm, modestly working, working on a common-sense principle, for the good of those sufferers most in need of his energies! The latter certainly does more for advancement in this newly-born colony, where yet there is a bit of fighting going on (with Ladrões). After things are more settled there is ample time for the germologist. In lenience toward his misapplied energy, even while there are macroscopic topics of more consequence, let us indorse him to the extent, that we trust that some day he will catch his germ, and pin it fast to the butterfly case of record, hoping posterity will be benefited bye and bye—so we dismiss him temporarily. My plea is not against the microscope, but I wish to leave it in expert hands. If there are those who have come to do microscopic work alone, let them do it, and not neglect something that they are familiar with for the sake of dabbling in work for which they were not detailed,—every man stick to his original job.

In the opinion of many, skin diseases deserve the most thought from those serving in the Philippines. It is useless to attempt an enumeration of all the names given to each by various authorities, many of whom differ diametrically; to discuss them "tout ensemble" without classification will bring out my observations clearer. The organ of life designated as the skin, but which is generally thought to be a mere covering, not unlike our clothing, even by some well-

educated persons, is taxed to its utmost in this climate, not only because of the tropic heat but because of many conditions of living here. The Philippine sun seems to have a powerful influence upon the body, an over-stimulating effect, like unto the surcharged X-ray, penetrating the skin along the nerve fibres, and exerting its influence upon the entire nervous system. I am of the opinion, the sun's rays exert this unknown influence more in the region of the Philippine Islands than in any other tropic country of the world; because, for one thing, we do not accommodate ourselves to our environment, we do not dress properly, we do not bathe our bodies systematically as we should, owing to the non-settled state of affairs, and most of us eat and drink improperly. I repeat, that many think, other than a protection to the flesh, blood vessels, nerves and bones, the skin could be dispensed with, parchment or canvas answering the same purpose. No one outside of a medical graduate thinks of the skin as a vital organ of life. I would be pleased to show some of them the dangers of removing more than one-fourth of this cuticular covering, only I refrain from annoying my conscience to that extent—I do not wish to be responsible for life. It ought to be well known however, especially in our large cities where great fires are not infrequent; that extensive burns destroying large areas of skin, always prove fatal. Now it is not necessary to destroy entirely an organ to disable the human economy. If we weaken a vital element, all the remaining machinery of the human organization suffers in proportion. The skin is disabled in the Philippines, hence most of the nervous troubles. What is to be done when a life producing unit is disabled, and is all the while subjected to the disabling influence? This is a pertinent query. I should suggest very great care and nursing of this constituent; pamper it, and do not expect more of it than God Almighty intended. If we white-skinned races expose our bodies unduly—for we all know from childhood that white surfaces blister and black ones do not in the sun)—overstimulating our circulation artificially, at the same time, and do not wash off the greater output from the sweat

glands, we make this part of the machinery work over-time, and under the most unfavorable conditions. This injustice to a thermic regulating, breathing organ, will cause more trouble than if a part were torn off, thus entirely exposing the flesh, blood vessels, nerves, and all the delicate structures beneath. A covering is sufficient to protect these but when we remove a covering possessed of vitalizing functions, the great harm comes from this loss, and not because of undue severity to the structures beneath. The underlying tissues can be artificially protected from harm, but the function of the working covering is lost forever, and so what remains must do extra work. Such a state corresponds with an active regiment; kill off a third, or make the whole inefficient by over-work, and you get bad results in either case. The glands of the skin are the individuals in the regiment; weaken the individuals and the regiment deteriorates.

Not only in guarding our skins do we have to contend against the sun's rays with all their forcefulness, as agents arrayed against these glands, causing inflammations of every description,—but insects prevail in vast quantities, their stings and bites add to the enemy's strength, and so we must prepare against many foes, and toughen the point of first attack. Here are found insects in choice assortments, centipedes, spiders, scorpions and the festive mosquito in all his glory. The reptile family I shall not mention, and yet there is a healthy proportion of these as in all tropical countries. Even after months of residence in the Philippines when one has become acclimated to the singular potency manifested by the influence of sun, there is in reserve an array of living things to prey upon the poor alien's depleted cuticle.

Investigating the cause of that sudden exhaustion seen in our Marines during the Samar campaign. I discovered that most of the cases of "giving up" (as they called it) on the march, was due to a species of land leech. This blood-sucking animal would fasten itself to the bodies of our men while they were asleep, or even while they were walking along the trails (as there was little or no pain experienced when this

occurred), it would attach itself to their legs unbeknown and carry on its depleting influence silently, but almost deadly to the unfortunate victim. The fact that these creatures had accomplished their nefarious work before discovery, suggested to my mind the most serious side of the circumstance, for forewarned is forearmed. I wish to particularly note this fact, and hope that it will reach the recognition of some of those who may be similarly placed. This was not all the harm; wherever there was a mark of the leech showing where it was attached, an ulcer resulted in over seventy-five per cent. of the cases, these apparently harmless sores soon developed into the characteristic tropical ulcer, with all its tardiness in healing, and other unfortunate consequences. These ulcers alone were a cause of great suffering, barring exhaustion from loss of blood in the primary stage. We know that such ulcers are a most malignant variety, producing no end of pain and inflammation.

It is true, moreover, that insects not only expend their poisons with their stings, but there is another easy avenue. In the vile habit of tuba drinking, there is presented a favorable means of expending the poison by the wholesale, at once and in concentrated form. Some little explanation here is not amiss. Tuba is an intoxicating liquid of the Filipinos made by cutting off the blossom stalk of the cocoanut tree, then collecting the escaping sap, from the stump, into a bamboo tube, (about three feet in length and five inches in diameter)—hence the name "tuba". This tube is fasted in the tops of the tree, allowed to remain there maybe for days before it is filled, and then another tube takes its place. In the meantime every sort of insect gets into it. Tuba, having an attraction for bugs, they swarm about the fermenting liquid fall in, and die. Although the natives strain out all dead insects, after removing the tube from the tree, there remains in liquid form a strong essence of bug. This to my mind, is why such a poisonous drink is considered by local authorities, to have on the men so maniacal and deadly an influence. Not only do insects haunt the so-called tuba trees—(so called be-

cause such trees bear no fruit, and are used for the manufacture of tuba exclusively), but birds and bats have acquired the habit, and they toosometimes fall in, also. I have known the enormous fruit bat to get so drunk on tuba that it first became quarrelsome with its neighbors, and then dropped down out of the tree upon the ground, in a semi-paralyzed state.

The concoction known as bino, is another alcoholic poison that I would warn the American (living in the Philippines) against. This bino is a vulgarism for the Spanish *Vino*, and is made of anything the most handy. When anyone asks for bino, he may get a poor red wine, or a bad white wine, doctored to suit the market; and when the natives choose, they will put in red pepper, or wood alcohol, because it then savors more of alcoholic stimulant; whatever else it contains is guesswork, but in most cases it contains wood alcohol.

It may be safely said, that alcohol is not a necessity, as some have advanced, in any part of the tropics, but if one is addicted to the use of it he should confine himself to the best that is to be had, and he should never indulge in the drug until his system has awakened for the day's work—that is to say: he should never drink before the mid-day meal. My sincere opinion is, that it is better not to drink any while serving in the Philippines, unless prescribed by a competent physician, and even then many stimulants are at hand equally as good. To live properly, dieting oneself and keeping down deposits of uric acid with plain food, is far better than to over-stimulate the system, thus fooling ourselves into believing that we are capable of as much work in the tropics as elsewhere.

It is impossible to exert the energies of white men more than that which the natives themselves attempt. Therefore it should be a rest to the body during the heat of the day, no work between the hours of eleven in the forenoon and three in the afternoon, this time must be employed in sleep. One should avoid the sun as much as his duties will



allow, and when obliged to be in it, a perfect protecting head covering is imperative. Do not expose the head or face to direct sun rays, and keep your eyes well shaded. I have seen the eyes so sunburnt, as to permanently weaken them. A thick cork or pith helmet, large and drooping to the rear, to protect the nape of the neck, is the best head gear. Do not weaken the mucous membranes with alcohol or stimulating food, and protect the skin as much as possible, ever on the alert to help nature with these tissues, which must bear the brunt of climatic conditions. A mild solution of tepid carbolic acid ( $\frac{1}{4}$  % phenol in water) sponged over the body after the daily bath, will do much to prevent skin diseases, and is far better than stronger solutions applied after trouble has set it.

My suggestions as to the mode of life in the Philippines are: to avoid over-stimulating, avoid the sun, and keep the body cool by frequent bathing. Lemon or lime juice in water is much more wholesome than alcohol, for if we look carefully into the many fancy-named fevers, we find that the congested liver is responsible for a likely number, and therefore calomel and soda are more frequently called for than the antipyretics. My own experience allows me to make this assertion. When the tissues become lax, as is observed in many cases of dilatation of the stomach, and dropsical effusion into the lower limbs, then it is time to take two or three months' vacation and go to a colder clime. Disillusion yourself of the notion, that alcoholic stimulant will rejuvenate those enervated tissues; and beware of the advice of such charlatans as would influence you into postponing your vacation at this critical period. When these symptoms of laxity and depletion appear, I repeat: then it is time to leave the Philippines, remaining away until there is a resilience to the normal of the weakened condition.

In conclusion, I may add a few short hints as to daily life apropos of my personal observations above stated. The wearing of a flannel band about the abdomen is not a necessity, but a habit and notion handed down by the British pio-

neers of India. I am convinced however that the abdomen should be protected while sleeping, at other times the wearing apparel and exercise supply enough heat, and prevents chilling of the abdomen by evaporation of sweat. I would advise whenever it is necessary to lie down and sleep, that a blanket be handy to throw over the abdomen, and in some cases of very restless sleepers, a broad flannel band may be substituted at bed time. Water supply is the one thing where care is imperative; drink distilled water if possible, and have your clothing washed in the same; if this cannot be done, the wash clothes should be boiled. I believe if there could be established a regular rate, designated, "Laundryman", by the Secretary of the Navy, and that each ship could be allowed its proportionate number, thereby having the ship's washing done on board (with distilled water), it would materially prevent the spread of Dhobie (or Dobie) Itch. I would strenuously advise that food handled by the natives to any great extent, be debarred from the messes; not that I wish to criticise the Filipino's personal habits, but my observation prompts me very clearly in this matter, and I sincerely believe I am correct in warning against it. The natives do not keep their hands clean, although it is said their bodies are washed daily, at all events, they are not microscopically clean. I would advise Americans to be extremely careful of this little detail, as it may seem, and I would moreover advise the laity to accustom themselves to the art of disinfecting their hands by occasional ablutions in one-tenth per centum ( $\frac{1}{10}\%$ ) solution bicloride of mercury. They should be cautioned to use the hands for what they were created and be warned against scratching; use a disinfected wood or ivory back-scratcher if imperative. Keep the hands away from your face and hair as much as possible during working hours. Scrupulous care of the teeth is another precautionary measure against disease in the tropics, by this I include, perfect cleanliness of the mouth, nose and fauces. My plan is to clean the teeth upon rising and upon going to bed, with a camphorated saponaceous dentifrice, not using enough force

to injure the enamel; after this I rinse the mouth and gargle the throat with warmed Dobell's solution of boric carbolic mixture. It is advisable as well at these times, to snuff some of the warm antiseptic fluid up the nostrils, allowing it to flow past the posterior nares without swallowing; with a little practice this can readily be done without causing gagging or complications with the eustachian tubes. Adopting these habits of microscopic cleanliness, I am convinced that the chances for contracting contagion are reduced to a minimum.

There are many other topics bearing upon the train of thought expressed in this paper, but those only striking me the most forcibly I submit now, trusting that some good may possibly be gleaned from these few personal impressions and observations.

#### A BED LITTER FOR TROPICAL SERVICE.

**B**AMBOO in the form of two strong pieces 2m. 40cm. long with four traverses of smaller bamboo 62cm. long with the handles suspended by cord at either end from a piece 4 metres long, the ends of which are carried on the bearers' shoulders,—is advocated as a material for litters in the tropics, by Dr. R. A. J. Snethlage of the Dutch service. Perpendicular pieces 1m. 40cm. are attached to this long pole at each end as a support when the bearers are resting. The whole is covered with a light material which protects the patient from sun or rain. The litter may be utilized as a bed by setting upon four stakes, and as an operating table in a similar fashion with longer stakes. Its weight is very light, its bulk is small, its cost is slight and it is peculiarly adapted to tropical service.—*Militair-Geneeskundig Tijdschrift*.

## PUBLIC HYGIENE IN PORTO RICO.

By CAPTAIN JOSÉ LUGO-VIÑA,

ASSISTANT SURGEON OF THE PORTO RICO REGIMENT OF THE  
UNITED STATES ARMY.

**S**AN JUAN, the capital of the island of Porto Rico is built on a rock rising high from the sea. It is very precipitous on the north side, sloping abruptly to the south. It presents many of the conditions of a ship at anchor.

From its topographical position and benignant climate it will undoubtedly become some day one of the most healthful and popular resorts of the West Indies. Unquestionably the unwholesome conditions of the city will be modified in time. The houses are built entirely of stone, some of them two or three stories high. The streets and plazas are bare of trees. The inhabitants are crowded into an area seven times too small to accommodate them and its general conditions do not comply with the requirements of a tropical climate. Even the houses occupied by the wealthier classes are not built in accordance with sanitary principles. The ground floors of these houses are occupied by laborers and their families. These rooms are badly ventilated and into them the sun never penetrates, making them dark and ill-smelling. These unwholesome conditions and poor food give us the key to the cause of many of our diseases.

This state of affairs was not owing to neglect on the part of the Porto Rican physicians. Year after year they strove to induce the Spanish Government to establish a sanitary service in as complete a form as possible in accordance with modern scientific teaching, but they were never successful in this struggle.

These matters were among the first to claim the attention

of the American Military Government on taking charge of affairs in October, 1898. Measures were taken which in no way interfered with individual rights or could be considered abuse of authority. Orders were given and obeyed. A local board of health was formed and in a short time the outward aspect of the city was so changed that it ought to have stimulated the zeal of their successors if they had had at hand the means that were at the disposal of the Military Government.

Not satisfied with cleaning the streets, plazas and alleys of the cities and comprehending that the mode of life of the Porto Ricans was one of the principal causes of our physical degeneration, the Military Government took measures to relieve the congested condition of the city. The Orphan Asylum containing children from all over the Island and which was under the same roof as the Insane Asylum, was removed to the suburb of Santurce as well as the leper and two private hospitals. Places were found for Normal and High Schools. A petition was sent to Washington asking that the military buildings now occupied free of rent, as quarters by the higher employes of the civil government, be used for public schools. Much interest was taken to bring about the opening of the Federal lands which lie to the east of the city, cutting off all growth and development. With the object of providing better and cheaper food for the people the municipal tax was removed from beef and flour. The effect of this measure has been contrary to what was expected. The only benefit derived has been to the speculators in these articles, as retail prices have doubled and the city has lost one of its principal sources of income. With the desire to unite physical to mental training, corporal exercises and singing were introduced for the first time in the public schools. The Porto Ricans were encouraged to practice athletic games so necessary to the development of the body, which have now become very popular, and good effects are already noticeable. Measures were taken in regard to public nuisances. A Lock Hospital was established. The sale of liquor and tobacco was prohibited to minors; the water of the public cisterns was analyzed

and the deficiencies of the water supply were considered. A rigid inspection of the food was established as it was evident that the unusual development of intestinal diseases was owing to the bad quality of food consumed. It has been seen that intestinal diseases have diminished in a marked degree since this order went into effect.

Vaccination was made obligatory and under the direction of the Chief Surgeon, more than three-quarters of the inhabitants of the Island of Porto Rico were vaccinated by the municipal physicians and their assistants; thus exterminating smallpox, as since then only two cases have been reported, and these were brought to the port of Arecibo from New Orleans on the steamer "Mae", a short time ago.

This was the state of affairs when a general order was issued creating the Superior Board of Health of Porto Rico. The first efforts of this body were to formulate a Sanitary Code. In view of the indisputable importance of the subject and the imperious necessity of taking energetic measures to regulate by law the sanitary service, it is necessary that this Code be finished and put in force as soon as possible, so that it may correct in a measure the bad conditions by which we are still surrounded.

The Porto Rico Regiment was formed, composed entirely of natives. The improvement made by these young men in the last three years has exceeded by far the expectations of its organizers. The "esprit de corps" and good feeling that is being encouraged among them will unconsciously aid in their Americanization. So we have at last, after 400 years, a most practical school, where the moral and physical regeneration of our people has begun.

Thus it will be seen that we have not only to seek for the micro-organisms that impoverish the blood of our people, but also to try to improve our ways of living and the conditions by which we are surrounded. We are descended almost exclusively from one European nation, which, though strong and vigorous on its own soil has bequeathed to us through the influence of a tropical climate, an enfeebled constitution.

We have lived for centuries without sanitary laws that might in part have remedied the evil, and without schools or religious ideals, lost amid the waters of the Caribbean Sea.

All measures calculated to promote the welfare; to give encouragement and strength to our people; to furnish them with means to secure a comfortable livelihood; and to supply them with wholesome food at reasonable prices should be carefully fostered.

It should be taken into consideration that we have lived without light, home, soil, or air, and we have lacked the moral and physical force to open our way in the world, but now, in spite of all we are ready and anxious to do our best in the work of reconstruction.

It should be remembered that Porto Rico is rich enough to pay liberally for all that is done in her behalf.

San Juan, Porto Rico, April 30th, 1902.

#### PISTOL SHOT WOUND OF CHEST AND ABDOMEN.

**I**N *Le Bulletin Medical de l'Algerie*, M. Denis describes a case in which a pistol shot penetrated the abdomen between the ensiform cartilage and the umbilicus, emerging in the line of the posterior axillary border at the seventh or eighth intercostal space. Laparotomy under spinal cocainization was performed, an enormous amount of blood mixed with alimentary matter removed and, the bleeding point not being discovered, the hemorrhage was controlled by tamponing. On the sixth day fecal matter appeared at the thoracic wound, continuing for about two weeks, when the wound gradually closed and the patient ultimately recovered. The author makes a retrospective diagnosis of contusion of the large intestine with consequent gangrene and discharge of the eschar, producing a secondary opening of the gut, although he admits the possibility of a wound of the mesenteric border of the colon where a bleeding point might have escaped the surgeon's eye, and which might have given exit to the fecal matter.

## QUARANTINE AS THE PICKET-LINE.

BY PARKER C. KALLOCH, M.D.,

SURGEON IN THE UNITED STATES PUBLIC HEALTH AND MARINE  
HOSPITAL SERVICE.

**T**HE immunity of physicians to infectious diseases is often explained as being due to lack of fear, the fear of disease being regarded as a predisposing cause for acquirement. The public does not understand one's voluntary submission to such danger without special protection.

Yet the instances of illness and death from such exposures are quite common, and it must be the disparity in numbers between physicians as a class and the rest of the community, that leads one to regard the physician as especially immune.

The history of epidemics of cholera and yellow fever would show that physicians have given up their full quota as sacrifice to the unwisdom of living under unsanitary conditions. They are nevertheless always to be found at their post of duty, though that is often in the very midst of danger. This was true when infection was regarded as being borne by some indefinite miasma, against which no human wisdom could prevail, and it is true now, when in many cases we know the means by which the disease is carried.

A physician has always been considered especially qualified for duty in a yellow fever epidemic if he has been immunized by an attack of the disease, but lack of such immunity has not often been allowed to interfere with the ready response to the cry of distress or the call for volunteers. The death roll of physicians during the fatal epidemic at Memphis, should stand in perpetual memory to the heroism of those who gave evidence again of the oft-repeated proverb—"greater love hath no man than this."

At the breaking out of a dangerous epidemic, it is not



unusual to observe a condition of panic in the community. The out-going trains are overloaded with terror-stricken people, fleeing from what they regard as a germ-laden atmosphere, their one desire being to get beyond its influence. The other means of exit are filled with the belated and impecunious travellers, with what necessities they can carry, anxious to get away from the pestilence.

In this turmoil you will find a few quiet, brave souls, whose profession I need not name, forgetful of personal danger, in consultation as to the best methods to be adopted for saving the lives and fortunes of their fellowmen. Their broad vision takes in, not only their own people but those of surrounding districts. The questions which present themselves are, in the order of civic unselfishness,—first, how to protect the country against the spread of infection from this point; second, how to protect the remainder of the city or town; lastly, how to save those in immediate danger.

Quickly, through the authority of health laws, steps are taken to stop the exit, by closing the doors to the outer world. Then the affected house and locality are shut off, to confine the infection as far as possible to its present focus, and meanwhile the needs of the sick are attended to it.

As epidemics, requiring such measures, are usually imported from other countries, there have been established at points of commercial entry, quarantine stations, the function of which is generally known. The importance of this function, however is sometimes underrated.

In the earlier days, when the present system of quarantine was in process of formation, the quarantine doctor labored under greater disadvantages than at the present time. There was often a conflict between the government and local authorities, the powers of neither being strictly defined. In some cases this want of harmony caused unnecessary expense and delay to the vessels, and the doctor came in for his share of the blame.

His position was necessarily a lonely one, more or less remote from the mainland, and his supplies depended, as they still do, in some cases, on the caprices of wind and weather, to which were often added human perverseness. He was not

expected to approach the mainland, as an atmosphere of infection was supposed to attend him.

In this lonely situation, he was of great comfort to the sick and afflicted, who came to him and applied for entrance to the country. He acted in the capacities of physician, friend and sometimes nurse, cheering their solitude and comforting their distress. The story of these kind offices might well be written if the testimony could be gathered from the four quarters of the globe.

A quarantine officer's life is often full of incident and his responsibilities are grave. At times the life seems peaceful and serene, but suddenly, new problems arise and circumstances seem to conspire against him. He must have good health and steady nerves to carry him through his rough experiences. He must be tactful to those to whom the rigid rules seem unjust; sharp-eyed to detect the concealment of important information; resourceful to apply remedies under unusual circumstances, and firm in the discipline of those engaged in the details of the work. He must be quick to decide, and have clear ideas of the varied features of sanitary methods.

After the exercise of every care, when the time comes for the final discharge of a vessel which was believed to be infected, the question arises,—is there still a possible chance of danger remaining? Human judgment may err, yet a great deal depends upon it.

But the old theories of the means of infection are departing. Cleanliness, fresh air and sunlight were regarded as the chief immunizing agents in our quarantine hospitals, and experience seldom offered a contradiction, but while we still recognize the value of these agents, scientific investigation, especially in yellow fever, has pointed out the one chief danger, and we may expect from our new efforts, very definite results. All honor to those, who, through hard work and personal sacrifice, have given to us this added knowledge.

The gradual supplanting of the slow-going sailing craft by the swifter steamer, will make the sad tales of suffering on long voyages less frequent, and the new methods of inspection at ports of departure and the gradual taking up of

modern sanitary methods in other countries by common agreement, with our health authorities, will make the problems of quarantine less trying. But let us not forget those who have borne the burden through the days which called for greater self-sacrifice.

Our quarantine stations still form the picket-line and they require watchful eyes and a sense of devotion to duty, which those in the ranks are not so often called upon to exercise, and like many important positions in life, the chief reward lies in the feeling that though our efforts have not excited the interest of the world, they have been worth while.

#### FRACTURE OF THE METATARSUS IN MARCHING.

**A**N unduly-arched foot and claw-like toes go together, hollow-foot and claw-foot being convertible terms. The dual deformity, with callosities on the sole associated, is in minor degree very common. It is due, as I hold, to disuse of the toes, to failure of the muscles which should act on the under surface of the first phalanx of the great toe and the second of the others, in order to prevent the retracting influence of the long flexors on the final phalanges, and so to ensure the pressing influence of the latter on the ground surface. By this means the great toe is kept straight, and its short flexor and adductor muscles, acting from the great toe (as a fixed point) on the under surface of the arch, limit the formation of it. In doing this they also help to uplift the head of the metatarsal bone, relieving the skin upon it from undue pressure and friction. For all the metatarsal bones this function is effectively performed by the long flexors when they act on toes properly held in position. If, however, the two muscles mentioned fail to hold the great toe in position, they fail also to limit the formation of the arch. Then the powerful long flexors over-form it: they permanently bend the metatarsal bones, and these, being already bent, may be actually broken by specially violent action. The moral is: Let the "young soldier" be taught to habitually use his toes as pressing organs, and thus fulfill all of their physiological purposes.—*T. S. Ellis in British Medical Journal.*

## CIRCUMCISION AND FLAGELLATION AMONG THE FILIPINOS.

By LIEUTENANT CHARLES NORTON BARNEY,  
MEDICAL DEPARTMENT OF THE UNITED STATES ARMY.

WHILE I was in the Philippines in 1899 and 1900, and particularly while stationed at San Miguel de Mayumo, Calumpit, and Hagonoy, in the province of Bulacán, Luzon, I had exceptionally good opportunities, through the assistance of two educated and liberal natives who spoke Spanish—one a *mestizo* and the other an *indio*,—for learning about some of the less generally known customs of the Filipinos.

The *indios*—those who have the least admixture of non-Malay blood—are as a rule extremely secretive and distrustful of foreigners, whom they call "*Castila*"—a word derived from the Spanish "*Castellano*," which means Castillian or Spaniard. This term is applied by the Philippine *indio* to all white men. The great body of the natives are as secretive toward foreigners as are the Chinese. Priests and others who have spent their lives among them say that it is impossible for any one to understand their character unless he has played with them in childhood and lived his life as one of them. They have a great many ancient pagan rites and superstitious customs, of which some are derived from the rites of various religious systems and some are of secular origin. Some of those which had their origin in religious observances have long since lost all religious association, while others which formerly had no connection with any system of religion whatever have become embodied in a sort of semi-christian semi-pagan worship. Most of the Tagalos, who are nominally Christian and Catholic, observe not only the rites of the Catholic Church, but many pagan rites and customs as well. Some of these latter are purely tribal in their prevalence, while others are observed throughout the archipelago and have

come to hold an almost national meaning and association for many of the natives. Even the fact of the existence of some of the most prevalent of their customs is unknown to many white men who have spent considerable periods of time in contact with the native.

Though I have read, I think, every book descriptive of the Philippines published previous to 1901 in the English language and many of those published in Spanish, I do not remember to have seen any mention of circumcision in any of these books, and the only mention of flagellation which I recall was in Foreman's very comprehensive book, in which he mentions that a Spanish sea-captain told him that he had seen flagellants in one of the more southern islands. Extremely few white men have seen flagellants in the Philippines though flagellation is prevalent. I believe that the following is the first published description of circumcision and flagellation as performed in the Philippines.

CIRCUMCISION is a very ancient custom among the Philippine *indios*, and so generalized that at least seventy or eighty per cent. of males in the Tagal country have undergone the operation. Among them being uncircumcised is looked upon as a defect, so much so that children of both sexes cruelly taunt those who have reached the age of puberty and are still uncircumcised. They apply to them with intent to insult the term "*supút*," which originally meant "constricted" or "tight," but has come to mean "one who cannot easily gain entrance in sexual intercourse." When American troops first came to Hagonoy and bathed in the river the fact that they were uncircumcised was a subject of great gossip in the market place. It is not known where the natives got the custom—possibly from the Mohammedan Moros of the southern islands. The Moro men are all circumcised by their "*panditas*," or priests, as a religious ceremony necessary to make them eligible for matrimony, but among the Tagalos, who are professed Catholics, the operation has no religious association. Neither is it among them done on account of any idea of cleanliness, but from custom and disinclination to be ridiculed. The friars were not able to root out the custom as it was an ugly subject to treat of from the pulpit. Among the Jews the operation

is done on the tenth day after birth, but among the Philipinos—both Mohammedan Moros and Christian Tagals—it is practiced at the age of from eight to twelve years. In the Tagal country it is called "*tuli*," and is performed as follows: The operator provides a polished piece of wood, sufficiently curved and of such length that when one end of it is driven into the ground the boy to be operated upon can squat "on his hams"—practically sit on his calves—and insert the free end of the stick, which is pointed, between the head of his penis and his foreskin. After the foreskin has been drawn over the point of the apparatus, which is called "*tamurung*," the operator, also in the squatting position, picks up a sharp knife and places it so that the edge rests lengthwise on the foreskin. Then, holding the knife in place with one hand, he gives it a sharp blow with a stick of wood or a joint of cane held in the other. If he does not succeed in entirely exposing the head of the penis at one blow he gives a second or even a third. Guava leaves, which are astringent, are afterward applied in the form of a paste made by chewing the leaf, or in the form of a powder prepared by burning them, and the wound is bandaged. The dressing is changed daily. While the wound is fresh the patient cannot wear trousers on account of the pain they would cause, and he wears instead merely a cloth dropped from his middle.

FLAGELLATION was a custom probably taken from the early Spanish friars, but it has been so discouraged of late years by the Church that it is performed only in the smaller villages of the interior and in the outlying *barrios* of the larger towns, more or less secretly, away from the sight of white men. But, notwithstanding the fact that the existence of flagellation among the Filipinos is practically unknown to foreigners, it is extremely prevalent during Holy Week. On Holy Thursday in 1890, while at Hagonoy in Bulacán Province, having learned about the flagellants from a native, I took some pains to see something of them, and riding out alone at some risk succeeded in seeing a number.

Although the Philippine flagellants are called "*penitentes*" the flagellation is not done in penance, but as the result of a vow or promise made to the deity in return for the occurrence

of some wished-for event, and the "*penitentes*" are frequently from the most knavish class. A person falls ill, for example, and he promises the deity that if he gets well he will perform penance of such and such kind, during such and such days of Holy Week, for so many years. Or if he has an enemy whom he wishes to get rid of he vows that if this enemy dies he will drag a ball and chain, or flagellate himself, or perform some other specified penance on Holy Thursday every year during the rest of his life. Back of the small chapel called "*visitas*," which exists in every village, begins his penance. With his face covered to prevent recognition, stripped to the waist, and with no clothing but loose thin white cotton trousers, one finds him standing with his arms folded, his head bowed forward, and his body bent, while an everyday-looking native slaps him on the back till the blood comes into the skin. Then he is spatted with a piece of wood with little metal points in it till his back is macerated and the blood runs freely. Then he starts out on a long day's journey from *visita* to *visita*. He is certainly a wierd and barbaric spectacle as he silently and slowly stalks along with covered face, swinging from side to side a cord into the end of which is braided a bunch of sticks about the size of pencils, which strike his bare bleeding back with a loud sound at every step and macerate it so that the blood oozes down and soaks his white trousers. At short intervals he prostrates himself in the dust, utters some unintelligible jargon, possibly a prayer, while the everyday-looking citizen spats him on the back and on the soles of the feet with a flail as he grovels there. At intervals the outlandish figure goes through grotesque contortions or progresses by handsprings. Whenever he comes to a stream or ditch he plunges into it, and whenever he reaches a *visita* he grovels before it and spends much time in prayer. One may see these flagellants lying prostrate in the dust for long periods at a time. But the chief picture one carries in mind is an erect native with covered face bare bloody brown back, and blood stained trousers, stalking slowly forward along the bamboo-fringed roads to the rythmic accompaniment of the swinging scourge while from every house for miles comes a wierd monotone lilt which represents the chanting of the passion.

REPORT OF A CASE OF SUBDURAL HEMORRHAGE  
WITHOUT FRACTURE OF SKULL. OPERATION  
FOLLOWED BY COMPLETE RECOVERY.

By F. W. F. WIEBER, M.D.,

SURGEON IN THE UNITED STATES NAVY.

**M**IDSHIPMAN H. A., was injured on the afternoon of November 15th, in a football game. Exactly how the injury was done, whether by a blow, a head collision, or a fall, has not been ascertained; the only outward sign of a head injury was a slight swelling on the left upper eyelid, which was noticed on the next day. After a scrimmage the above Midshipman did not rise, when lifted on his feet he was unable to stand, his head hung to one side, he looked very pale. He was seen almost immediately by a medical officer, who found his pulse thready, the skin covered with a clammy perspiration, and the breathing very shallow. Under stimulation the pulse soon improved. The patient was removed from the field to the hospital on a stretcher, in an unconscious condition, and after his arrival there, put to bed. Hot water bottles were applied to the feet, ice bags to the head, hypodermic injections of strychnia and morphia were administered, and soon the patient vomited. The condition of unconsciousness had passed off in about half an hour; drowsiness, and heaviness remained. He kept his eyes closed, tossed about a good deal, and when spoken to, complained of a severe headache. The pupils were somewhat dilated, pulse about 72. The patient passed a good night. He slept well, awoke only once in the night, and said then that his head felt better. Once during the night he vomited, after taking nourishment. During the next day, he complained of his head, also of seeing double. During the night of the second day he was very restless, and slept only about half of the night. During this period, about 33 hours after the injury, the following new symptoms developed: Three times slight twitching of the right quadriceps extensor muscle were noticed by the nurse. During the following forenoon, muscular



twitchings became more frequent and involved then principally the right upper extremity, (triceps, deltoid, sterno-cleido-mastoid, and the flexors of the forearm). At times the left sterno-cleido-mastoid twitched with the muscles of the right shoulder and neck, at other times the entire right half of the body became involved during more severe paroxysms,—the tendency toward the afternoon being for the twitchings to become more extensive. General convulsions threatened several times, and led to the use of chloroform; several times, the diaphragm also showed clonic contractions. Sensation on the right side was reduced, muscular power weakened. The indications now seemed clear, namely, to expose the motor centers for the right side of the body and to remove the cause of the irritation, probably a clot. After consultation in the afternoon this was decided on, unless the symptoms should materially subside by night. In the meanwhile the hair was cut short and icebags were kept constantly applied to the head. Potassium bromide was given in large doses. At night the convulsive seizures lessened in frequency and severity, and interference was postponed. By about 10:00 p. m. patient had quieted down considerably, he rested pretty well and slept. Dr. Finney of Baltimore had been requested to join us in consultation. He arrived during the early hours of the morning of the 18th accompanied by Dr. Thomas, also of Baltimore. Fewer and less extensive twitchings were noticed during their stay and the general conclusion was that under existing conditions interference was not indicated. The pulse had gradually fallen by this time; it ranged from 50 to 56 beats. Treatment was continued. During the day convulsive movements of the right arm muscles again increased in frequency, they were, however, less severe than they had been on the previous day.

Patient was seen on that day, at the request of patient's father, by Dr. W. W. Keen, of Philadelphia, who confirmed our original diagnosis of intra-cranial hemorrhage and irritation over motor area on left side of brain. He considered an operation necessary, but agreed to wait another day on account of the expected arrival of the patient's father, himself a physician. The loss of sensation and that of muscular power on the entire right side was more marked than yesterday; reflexes on the right side were absent. On the 19th twitchings continued as before; toward the middle of the day,

after the arrival of the patient's parents, and undoubtedly largely due to the excitement caused by this circumstance, they increased in severity, the diaphragm became more often involved, and patient had several general convulsions.

The operation was performed at 2:00 p. m. by Dr. Keen, present Dr. Finney and Dr. Thomas of Baltimore and all the medical officers attached to the station.

The head, which had been shaved the previous day, was thoroughly disinfected. An osteopathic flap was raised from the left side of the head having a base line of four inches, one inch from and parallel to the median line of the head, the centre of which was over the fissure of Rolando. Its sides were each three inches long. They converged toward a bridge of about one and a half inches in width, above left ear. This narrow bridge of bone was broken by the lifting up of the flap. The dura was found bulging and tense. It was incised along the lines of the flap. After lifting it up a large clotted mass, covering the entire exposed surface of the brain and extending even beyond the uncovered area was exposed to view. By means of irrigation with a warm normal salt solution, and a scoop, this was removed. The clot was estimated to weigh about four ounces. The starting point of the hemorrhage was not discovered. A hole was cut into the posterior inferior angle of the bony flap for a rubber drainage tube, which was pushed in backward between dura and pia for some distance. A smaller hole was cut in the posterior superior angle for a gauze wick. The dura was then sutured with silk and the flap, composed of bone, muscle and skin replaced. Interrupted sutures which secured the soft tissues completed the operation.

The result was:

1. All convulsive seizures ceased immediately and permanently.
2. Progressive motor and sensory paralysis of entire right side, more complete in arm than in leg, followed very soon after the operation.
3. Complete aphasia gradually resulted. No aphasia had been noticed before the operation.

The drains were removed, one within twenty four hours, the other within thirty six hours after the operation. The

dressings were each time found saturated with sero-sanguinolent discharge. Patient was very drowsy; for a number of days he complained of severe headache; his temperature for five days was slightly elevated, the highest point reached was 101°, after this it went down to normal. All scalp stitches were removed by the fifth day.

Progressive improvement, and abatement of all the adverse symptoms set in about one week after the operation.

Five weeks after the operation, patient was well and able to leave for his home on leave.

The number of epileptic seizures on the 17th amounted to about 50; on the 18th to about 60; on the 19th to about 24.

The hemorrhage probably came from a small vessel near the leg centre and started soon after the injury. It did not give rise to symptoms until about 33 hours after the accident, when the amount of blood exuded proved sufficient to cause pressure, as shown by the slow pulse and the muscular twitchings. It is possible, that this gradual increase of intracranial pressure was sufficient to stop the hemorrhage, which had ceased at the time of the operation.

The paralytic symptoms which followed the operations must be explained:

1. By the injury done to the motor cells by the pressure of the clot. There had been progressive muscular weakness before the operation.

2. By the manipulations necessary to remove the clot. The vascular and nutritive disturbances in the brain center produced by these two causes furnish the only explanation for the short duration of the motor and sensory symptoms which resulted.

The fact, that they disappeared so quickly after improvement had commenced, was most surprising, the regaining of control over the paralyzed muscles seemed to increase almost hourly after improvement had once set in.

The operation was undoubtedly indicated:

1. Because the epileptic symptoms were on the increase.
2. It was feared that the respiratory muscles would become seriously involved.
3. Absorption of the clot might have been imperfect and permanent epilepsy might have become established.

# Medico-Military Index.

## MEDICO-MILITARY ADMINISTRATION.

**Heyerdahl (S. A.)** [Some remarks on the determining medical committee in the military schools.] *Norsk. Tidskr. f. mil. med.*, Kristiania, 1901-2, vi, 120-128.

**Idelson (L. M.)** [The command of two hundred and thirtieth battalion of reserves under instruction.] *Kazan Med. J.*, 1903, iii, 1-11.

**Janssen.** [The first aid package of the Dutch army.] *Caducée*, Par., 1903, iii, 21,

**Jerzabek (A.)** [Transportation of the wounded (in battle) by the non-wounded.] *Militärarzt*, Wien, 1903, xxxvii, 65; 81.

**Joseph (E.)** [The practical training of volunteer nurses, male and female, in the Berlin accident-station of the Red Cross.] *Rothe Kreuz*, Berl., 1903, xxi, 196.

**Kharitonoff (L. A.)** [Medical pack in the steppes of Mongolia.] *Voyenno-med. J.*, St. Petersburg, 1903, i, med. pt., 455-458.

**Langer (A.)** [Conservation of bandages.] *Militärarzt*, Wien, 1903, xxxvii, 6.

**Majewski (K.)** [Improvised transportation of the wounded on the march, in the light of experience gleaned from the military manœuvres.] *Allg. mil.-ärztl. Ztg.*, Wien, 1903, 16; 30.

**Neumann.** [Instruction in nursing in the German army.] *Ztschr. f. Krankenpf.*, Berl., 1903, xxv, 1-8.

**Nogier (J. J.)** [Sanitary and administrative policy of military hospitals; memoranda for the chief surgeon and personnel of these establishments,] 12°. Paris, [1903].

**Perego (V.)** [Improvised means of removing the wounded from the field of battle.] *Gior. med. d. r. esercito*. Roma, 1903, li, 40-51.

**Plantenga (H. G. W.)** [Attendants in military hospitals.] *Mil.-geneesk. Tijdschr.*, Haarlem, 1903, vii, 91-102.

**Romeyn (D.)** [The education of our hospital corps.] *Mil.-geneesk. Tijdschr.*, Haarlem, 1903, vii, 26-36.

**Saporeta (F.)** [Crime among Soldiers.] *Rev. mens. di psichiat. forense*, Napoli, 1902, v, 102; 148; 190; 277; 355; 1903, vi, 44; 124.

**Seaman (L. L.)** The army cartridge-belt. *Med. Rec.*, N. Y., 1903, lxii, 215.

**Sokoloff.** [Place of physicians as experts in recruiting bureaux (art. 109

and 171 of the code on military service, ed. 1897)]. *Vestnik obsh. hig., sudeb. i. prakt. med.*, St. Peterb., 1903, pt. 2, 200-204.

**Teich, (M.)** Einführung in den schriftlichen Dienstverkehr des bei der Truppe Eingeteilten Militärarztes. 8° Wien, 1902.

**Wanschel (O.)** [Essay on the development of the medical department of armies, especially in France and Germany.] *Janus*, Amst., 1901, vi, 573: 1902, vii, 17; 77: 135; 225; 346; 417; 449; 561.

**Wassmund.** [Retrospect of the first 25 years of the Military Hospital II, Berlin.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 177-183.

### MILITARY MEDICINE.

**Kelsch (A.)** [Tuberculosis in the army.] 8° Paris, 1903.

**Kieffer, (C. F.)** Tropical dysentery. Phila. M. J., 1903, xi, 209-215.

**Lefevre.** [Some notes on the typhoid fever occurring annually in the Infantry Barracks, New Caledonia.] *Ann. d'hyg. et de med.*, Colon., Par., 1903, vi, 312-316.

**Rugani (L.)** [Contribution to military acumetry.] *Gior. med. d. r. esercito*, Roma, 1902, l, 1121-1131.

**Sandrini (A.)** [Insolation and heat-stroke.] *Policlin.*, Roma, 1902-3, ix, sez. prat., 1412-1418.

**Shtetloff (N. I.)** [Evacuation of malarial patients and selection of those to serve in malarial regions.] *Voyenno-med. j.*, St. Petersburg., 1902, lxxx, med.-spec. pt., 4280-4311.

**Treille (G.)** De l'enseignement de la pathologie tropicale dans les Universités de l'Europe. *Janus*, Amst., 1902, vii, 238; 281.

**Truyts.** [Considerations upon the nature, cause and treatment of chronic cervical adenitis in the army.] *Arch. med. belges*. Brux., 1903, 4. s., xxi, 145-156.

**Viguiet. (E.)** [Tuberculosis in the army.] *Arch. gén. de méd.*, Par., 1903, i, 833-860.

### MILITARY HYGIENE.

[Cause of the typhoid epidemic which broke out at the close of the manœuvres of the IV Army Corps in the autumn of 1902.] *Cor. Bl. f. schweiz Aerzte*, Basel., 1903, xxxiii, 308-312.

[Comparison of morbidity and mortality in the French and German armies.] *Caducé*, Par., 1903, iii, 15-18.

[Examination of leathers used in the army.] *Arch. de méd. et pharm. mil.*, Par. 1903, xli, 473-477.

[Hygienic aspect of the floors of military barracks.] *Caducé*, Par., 1903, iii, 71-73.

Suicide among soldiers [Edit.] *Brit. M. J.*, Lond., 1903, i, 452.

**Albu. (A.) & Caspari (W.)** [Report on the investigation of endurance in the long-distance march from Berlin to Dresden on May 18-19, 1902.] *Deutsche med. Wchnschr.*, Leipz. u. Berl., 1903, xxix, 252-254.

## Editorial Department.

---

### NOTE ON THE INJURIOUS EFFECTS OF THE GASES PRODUCED BY SMOKELESS POWDER.

MY attention was recently attracted by an article in the *Archives de Médecine Navale* by *Medecin Principal Docteur Torel, M.F.*, and believing that the subject matter is one of general interest to military surgeons I have prepared a resumé of Dr. Torel's careful and exhaustive study.

As the result of numerous analyses made by himself and others Dr. Torel concluded that carbonic oxide and nitrogen dioxide or other nitrogen-containing gases are those producing the principal deleterious effects when combustion of nitro-cellulose compounds takes place in a confined space.

He describes in detail the results of target practice on board the *Massina*, April 2, 1902. The ship's bow pointed due north and she had the target on her starboard beam hence six shots were fired from the starboard 274 millimeter gun instead of three shots each from starboard and port guns as was customary. A gentle breeze was blowing from the east which made the gases of combustion flow back into the turret each time the breech was opened. The intervals between the shots averaged from two to four minutes. No sooner had the firing ceased than Dr. Torel was summoned to the turret to see the "boatswain's mate, the gun captain," who had fallen over in a stupor.

The patient was found unconscious his face pale and bathed in a cold sweat. The pupils were dilated, the limbs and body shaken by convulsive movements. Respiration was labored and jerky, the pulse small and irregular, the heart movements feeble and tremulous. His condition improved somewhat when he was stretched out on deck in the open air, but the epileptiform movements were of such violence that

the patient was with difficulty conveyed to the sick bay. The symptoms continued for half an hour and the patient was delirious, unable to stand on his feet, jabbering and mumbling like a drunken man. When the power of articulate speech returned he complained of severe frontal headache, extreme lassitude and pain in the pit of the stomach. He stated that before losing consciousness he had been seized by hazy vision, vertigo and sharp precordial pain. The gases in the turret were so thick that the men only saw each other as through "a heavy, reddish fog of acrid suffocating odor."

The "quartermaster gunner" in the same turret experienced similar vertigo and nausea and dyspnoea. He complained all day of headache and anorexia.

Dr. Torel performed the following experiments: A rat weighing 89 grammes was placed under a glass bell jar of 160 centilitres capacity the rim heavily ringed with vaseline to prevent leakage. Four grammes of smokeless powder were put in the jar but 1.5 grammes were found unburned when the jar was lifted. The rat died in 5 seconds with pupils dilated and limbs in spasmodic contraction. In removing the dead rat a large part of the fumes escaped filling the room with an acrid irritating odor.

A rat weighing 195 grammes was now placed under the same bell jar from which the fumes had largely escaped. Death occurred in 15 seconds after several squeaks, jumps and 3 or 4 convulsions. From a careful examination of the facts Dr. Torel concludes that the carbonic oxide is only in part responsible for the accident in the turret and the results artificially produced under the bell jar and regards the nitrogenous vapors liberated as the principal toxic agent. In other turrets and on other ships similar accidents have been not infrequent and the author goes on to emphasize the importance this matter would assume in battle. He argues that the possible disabling of a gun's crew from insufficient ventilation of a turret where smokeless powder is employed for the charges must be regarded as a more serious consideration than the slight diminution of their safety from the enemy's fire which might arise from installing inlets for fresh air.

J. S. TAYLOR, U.S.N.

THE ENNO SANDER PRIZE MEDAL AND THE  
BRITISH MEDICAL SERVICES.

THE Enno Sander Prize Medal for 1903 which was awarded to Major Frederick Smith, D.S.O. of the British Royal Army Medical Corps was made a feature of the recent graduating exercises of the Royal Army Medical College in London, upon which occasion the medal was formally presented by Sir William Taylor, K.C.B., to the successful competitor. In a letter to the editor, Sir William Taylor remarks:

"I read to the Commandant, Professors, Staff and Class at the College your letter of June 20th, and I think that if you had heard the applause with which the reading of your letter was greeted, you would have been quite convinced of the good feeling and hearty reciprocity that exists in my service towards the Association of Military Surgeons of the United States.

"We all appreciate to the fullest extent the generous good feeling that prompted you to allow Officers of the Royal Army Medical Corps to compete, and that appreciation was greatly increased by our knowledge of the kind way in which Major Smith's success was greeted by your Officers.

"I feel sure that this event will, as you hope, undoubtedly still further cement that friendship between the Medical Departments of our countries which already exists."

This event will certainly tend to deepen the cordial feeling already existing between the medical officers of the British Army and those of the United States. Not the least of the products of the nineteenth century has been the development of the feeling of comity between the medical departments of the various nations of the world and the growth of the idea that whatever differences may exist between the nations which they serve, they at least are always united in the common labor of alleviating suffering,—a fact which this happy event auspiciously accentuates.



## Reviews of Books.

### MODERN BULLET WOUNDS.\*

**T**HE Alexander Memorial Fund was instituted to provide a triennial prize in memory of the late Director General Thomas Alexander, C.B., of the British Army Medical Services. The title of the Essay for 1903 was "Injuries to Joints and Long Bones caused by Modern Small-Arm Projectiles with Special Reference to the Appliances required, and available on Field Service," and to the present work was awarded the prize. The author takes up the subject under four main heads, (1) Injuries to Bones, (2) Injuries to Joints, (3) Splints for Actual Field Service, and (4) First Aid. Both of the first two subjects are considered historically and practically. He is opposed to hasty amputations, commends conservatism from the operative standpoint and remarks that "the less we interfere with a healthy looking wound the better," and that "an endeavour should almost always be made in the first instance to convert the injuries into subcutaneous ones by antiseptics and rest in the hope that the skin wounds will heal. \* \* \* Once the external wounds are healed passive movement is in most cases desirable to prevent ankylosis. If the wounds do not soon heal it will be because of suppuration having set in. The line of treatment of these septic wounds is in nearly all cases to first try the effect of local antiseptics. If this does not speedily effect improvement resection, or more frequently amputation will be called for."

He comments upon the infrequency with which under modern conditions amputation is required for gunshot injury

*\*Modern Bullet Wounds and Modern Treatment. With Special Regard to Long Bones and Joints, Field Appliances and First Aid. Part of the Alexander Essay for 1903. By Major FREDERICK SMITH, D.S.O., R.A.M.C. 12mo; pp 100; London, J. & A. Churchill; Philadelphia, P. Blakiston's Son & Co, 1903.*

to the knee, but remarks that the ankle and wrist have not benefitted by the change in weapons as has the knee, and arrives at the general conclusions that:

"(1) Coincident with the adoption of the new bullet and rifle, wounds of bones and joints have become more amenable to treatment.

"(2) To some extent this is due to the alteration in arms and projectiles.

"(3) To a great extent it is the result of a better understanding and practice of aseptic and antiseptic methods.

"(4) In a lesser degree it is contributed to by improved medical, supply, transport and ordnance services."

For field splints he advocates the provision of stout hoop-iron or its equivalent in pieces about four and a half feet long, which could be moulded and cut to adapt it to the demands of various locations.

He believes that too much weight is attached to hæmorrhage in first aid and remarks that "all medical men know well enough that few people bleed to death on the battlefield, and that scarcely one of those few could be saved except by a man actually on the spot when the wound was inflicted." He also objects to unnecessary effort to carry the wounded from the field during action. He urges universal training in first aid and notes the inutility of the small red cross on the arm; but advises that every soldier be provided with a red handkerchief to be displayed as a guide when wounded, and advocates the equipment of bearers with hypodermics to abate suffering on the field.

We close our review of this valuable little book by the quotation of a personal experience. "It was my good fortune in South Africa," says the author, "to have handed over to me in a body the charge of a number of wounded men who had received first dressings and little more. The patients were in a church—all the lying-down ones on the floor. They were attended to in order of urgency. The medical *personnel* was much less in number than was required. Consequently in many cases the dressings were not removed for some days. What was the total result? Excellent! In many instances

the removal of the first dressing showed that no further application was really needed—the wounds were closed both ends. In most of the others the wounds looked healthy; they were wiped with swabs moistened with corrosive sublimate lotion and covered up again. When the oozing came through and had not dried the dressing was renewed in the same way daily, splints being removed for the purpose if necessary. In some where suppuration was evident, the cavities were syringed out with sublimate or carbolic lotion. All did well except one with brain injury, and one abdominal case. Two eyes were enucleated and one middle finger amputated. On a table alongside the medical officer when at work were large basins full of boiled water and antiseptic lotion—sublimate and carbolic. Hands, instruments, &c., were clean and were disinfected between each dressing. No dressings were entrusted to any one except the surgeon."

#### THE SURGERY OF THE HEAD.\*

**I**N this work, the author has treated the surgery of the head from a practical standpoint. The conditions frequently met with are given the most careful consideration: that this is the intention of the author is indicated when he says: "Three distinct kinds of subjects have secured attention; those conditions which are most frequently met with, are thoroughly discussed, those that are less frequently met with, but require instant relief, secure the next share of attention; and last of all, those that are of great theoretical importance, though of less frequency, are also fully considered."

The pathology and diagnosis are placed prominently before the reader, and are so taught as to secure a careful clinical study of each subject under investigation. To aid the reader references to the literature are given and he is urged to consult the current medical journals as well.

The first chapters are devoted to congenital malforma-

---

\**The Surgery of the Head.* By BAYARD HOLMES, B.S., M.D., 8vo. pp. xvi, 569; 90 illustrations; New York and Chicago, D. Appleton & Co., 1903.

tions of the head and face, followed by chapters on injuries to the head and face and fracture of the skull, cerebral localization, compression of the brain, abscess of the brain, otitis media, sigmoid sinus thrombosis, tumors of the brain, empyema of the accessory sinuses of the nose, etc.

There are many valuable suggestions throughout the work that the reader will find invaluable—especially so are those referring to the treatment of scalp wounds. These, if faithfully followed, would cause less suffering to the patient and do away with many hours of anxiety to the surgeon.

The author has produced a volume that is a marked deviation from the ordinary text book and one that will give satisfaction to the occasional operator as well as to the busy surgeon. The preface indicates that the volume will be followed by others covering the different fields of surgery and composing a complete treatise.—A. R. ALLEN.

#### HUMAN EMBRYOLOGY.\*

THE systematic study of human embryology is a comparatively recent feature of the work of the American medical student, a fact to which is doubtless due the paucity of literature on the subject by American authors. The extension of the period devoted to the work of preparation for medical practice has however opened a place for embryological investigation and the vacancy has been promptly filled by eminently qualified teachers and writers. The work of Professor McMurrich at the University of Michigan has attracted the attention of the profession on account of its thoroughness and its pedagogic quality. This materialization of his laboratory methods fully sustains his reputation. It is full but not diffuse and terse but not meagre. The subject is considered in two main sections: Part I, General Development, and Part II, Organogeny. The first part comprises the consideration of the spermatozoon and the ovum, segmentation and formation of germ layers, and the development of the

\*The Development of the Human Body. *A Manual of Human Embryology.* By J. PLAYFAIR McMURRICH, A.M., Ph.D. 8vo.; pp. xvi, 527; 270 illustrations. Philadelphia, P. Blakiston's Son & Co., 1902.

medullary groove, notochord and mesodermic somites, the yolk-stalk, the belly-stalk, and the fetal membranes. In the second part he takes up the development of the several systems and special organs, both in the fetal stage and the post-natal period. The work is to be most cordially commended.

#### INTERNATIONAL CLINICS.\*

THESE volumes appear with radical changes in the editorial corps and marked improvement over the volumes of previous series. The contributions are of a high order of excellence, representing the most recent thought and research.

In the first volume, the article on Aneurism of the Descending Thoracic Aorta is the most important contribution to the literature of this subject in recent years and is followed by an appendix of cases. The articles on The Treatment of Cardiac and Vascular Fibrosis; Hodgson's Disease; The Treatment of Anaemia; Anaemic and Vascular Murmurs by Reynold, Webb Wilcox; Nauheim Methods in Chronic Heart Disease with American Adaptations by Thomas E. Satterwaite; the Treatment of Chronic Urethritis by Ernst Finger; and The Treatment of Diphtheria by M. Howard Fussel, are able and interesting. An article by Frank Billings on Primary Intestinal Tuberculosis is opportune at the present time, and interesting clinical lectures by William W. Keen and Nicholas Senn are features of the volume.

Thomas Jonnesco's operation of Total Bilateral Resection of the Cervical Sympathetic in Basedow's Disease, is the leading surgical contribution to the volume, and an able article by George G. Ross on Acquired Umbilical Hernia in the Adult, is also worthy of special attention. The other contributions are able and should receive careful reading, while a resumé of the Progress of Medicine during the year 1902, is an able and important part of the volume.

---

\**International Clinica. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles.* Edited by A. O. J. KELLY, A.M., M.D., with a distinguished corps of collaborators. Thirteenth series. Volumes I and II. Large 8vo.; pp. 306, 311; with numerous illustrations; Philadelphia, J. B. Lippincott Co., 1903.

In the second volume a symposium on summer diarrhoea is a valuable and opportune contribution by able writers of this and foreign countries. The articles by Eugene Opie, of Johns Hopkins University, and John B. Deaver, Chief Surgeon to the German Hospital, Philadelphia, on Diseases of the Pancreas, will no doubt be greatly appreciated by the profession owing to the recent and present interest taken in diseases of this organ. The Rest Treatment by John Madison Taylor gives in detail the different procedures that are of value, and indications and contraindications for employing them.

The volume contains a number of other articles that are of value and importance, and is fully the equal in interest and variety to previous volumes.—A. R. ALLEN.

#### A MEDICAL THESAURUS.\*

**R**OGET'S Thesaurus has for many years been the indispensable tool of every English and American man of letters. It gives in parallel columns synonyms and antonyms. Instead of furnishing the meaning of words as does the ordinary dictionary, it supplies the word for the expression of an idea and its opposite. This function the work of Drs. Barton and Wells aims to perform in medical literature so far as synonyms are concerned. Antonyms, being considered of slight medical importance, doubtless, are not taken up. We note the absence of the expression, "first aid," which has attained, in military medical circles at least, a vogue which entitles it to be considered in the medical dictionary. The addition of explanatory definitions indicating the especial shade of the general meaning to be conveyed by the particular term has contributed to the great enhancement of the value of the book, which is fully supplied with cross references and other features contributing to the facility with which it may be employed.

---

\**A Thesaurus of Medical Words and Phrases.* By WILFORD M. BARTON M.D., and WALTER A. WELLS, M.D.; Small 8vo.; pp. 534; Philadelphia, New York, London, W. B. Saunders & Co., 1903.

REMARKS ON THE HISTORY, CAUSE AND MODE OF  
TRANSMISSION OF YELLOW FEVER, AND THE  
OCCURRENCE OF SIMILAR TYPES OF FATAL  
FEVERS IN PLACES WHERE YELLOW  
FEVER IS NOT KNOWN TO HAVE  
EXISTED.\*

BY LIEUTENANT JAMES CARROLL,

ASSISTANT SURGEON IN THE UNITED STATES ARMY.

THE known history of this disease dates back to the middle of the seventeenth century when it is said by Richard Ligon to have occurred at Barbadoes in the form of an epidemic in 1647<sup>1</sup>. In 1648 it is recorded by Pezuela that "there occurred in Havana a great pest of putrid fevers which remained in the port almost all summer. A large part of the garrison and a larger part of the crews and passengers in the vessels died." It prevailed also in the following year and again in 1653, '54 and '55 with a high rate of mortality. After this there is no report of its occurrence again in that city for over one hundred years.

In 1655 the disease appeared in epidemic form in Jamaica and again in 1671; Santo Domingo was visited by an outbreak in 1656, and Martinique in 1688 and 1696.

In the latter year it prevailed in epidemic form throughout the West Indies and is said to have made its first appearance at Vera Cruz.<sup>3</sup>

Yellow fever is endemic only in tropical and sub-tropical countries, but we know that it can be transported thence to temperate regions where an epidemic of short duration may follow the importation. The spread of the disease in the lat-

<sup>1</sup>Sternberg, in Buck's Reference Handbook of the Medical Sciences, Vol. viii, 1889, p. 39.

<sup>2</sup>Ibid. p. 40.

<sup>3</sup>Ibid. p. 41.

\*Received for publication, May, 1902.

ter localities is surely arrested by the onset of winter, and its revival can only result from a fresh importation by means of persons suffering from the disease, or through the introduction of certain mosquitoes that have fed upon patients during the febrile stage of an attack.

Now yellow fever was epidemic at Jamaica in 1655, at the time of its capture by the English, and again in 1671, after it had become a British possession. I was led by these facts to search for evidence of the prevalence of an epidemic disease resembling yellow fever, in England, subsequent to these dates, and which might reasonably be attributed to the intercourse between Great Britain and the West Indies. This matter is an extremely difficult one to determine on account of the paucity of description in the medical literature of that time, and because all fatal epidemic fevers were regarded generally as putrid fevers. Small pox and measles were recognized; the intermittent malarial fevers, typhus, typhoid and bubonic plague were all looked upon as distinct diseases, though possibly produced by the same cause, but fatal fevers generally, particularly when they were epidemic, were regarded as putrid or malignant. The cause was believed to be a putridity or fermentation of the blood, and gastric and intestinal hemorrhages were, like the skin eruptions, sweats and abscesses, regarded as conservative efforts on the part of the system to rid itself of decomposed material resulting from this fermentation of the blood. Hence bloody or tarry evacuations from the bowel were spoken of as putrid discharges. By some the liver was believed to be the seat of the decomposition, and the dark brown material ejected in the vomit was thought to be liver detritus and altered bile. From this it will be apparent how difficult it is to attach a proper significance to the term "bilious vomiting," so often mentioned in connection with these putrid or malignant fevers. If by "bilious vomiting" they referred to "black vomiting" then it would seem reasonably certain that yellow fever did prevail at times in England, Germany, the Netherlands and along the Mediterranean during the seventeenth and eighteenth centuries.



Thomas Sydenham 'records the prevalence of fatal epidemic fevers in London in 1661-63 and in 1671-74, and acknowledges that he was puzzled by their severity and difference in type from the fevers that he had seen before. He says, "The autumnal intermittent fevers which had reigned for several years backwards, appeared with new force in the year 1661, especially a bad kind of tertian, about the beginning of July, which continually increased so as to prove extremely violent in August, seizing almost whole families in many places with *great devastation*; after which it gradually decreased upon the coming on of winter, so as to appear seldom in the month of October." He states that these fevers differed from the intermittent tertians of other years in that (1) the fit was more severe; (2) the tongue was more black and dry; (3) the intermission between the fits was not so manifest; (4) the loss of strength and appetite was greater; (5) there was greater tendency to a double fit [primary and secondary paroxysms?]; (6) all the concomitants in short were more violent; and (7) the disease itself was more mortal than intermittent fevers usually were; (8) when it happened in persons aged, or of a bad habit of body, where besides, bleeding or any other evacuations had diminished the strength, it would continue for two or three months. Persons violently seized had vomitings, dryness of the external parts, thirst and blackness of the tongue. He was familiar with the value of Peruvian bark in the treatment of the common intermittent fevers but ceased to use it in these cases, because he believed it more harmful than beneficial. Rush, who had seen a great deal of yellow fever adds the following in a foot note: "The bilious yellow fever appeared in the same tertian type in many instances during its late prevalence in Philadelphia, and was generally fatal where copious depletion was neglected, and the cure attempted by bark."

Among the symptoms of these fevers, Sydenham mentions also the "iliac passion," a "terrible disorder," occasioned

---

<sup>1</sup>Rush's Sydenham, Philadelphia, 1809.

<sup>2</sup>Rush's Sydenham, Philadelphia, 1809, p. 11.

by immoderate vomiting; and accompanied by a "reversed peristalsis of the stomach and intestines" in consequence of which their "contents are ejected." "The small intestines yielded to the violent motion of the stomach, and at last the large intestine acted in sympathy." This "iliac passion" was usually preceded by fever, and if one accepted the proposition that the black or dark brown material vomited in yellow fever was present in these cases and was mistaken for intestinal contents, the picture would be made complete. It is hard to imagine any "prevailing fever" in which fæcal vomiting would be present as a symptom, hence the most natural deduction would seem to be that his description of "iliac passion" applies to genuine "black vomit."

Dr. Philip Syng Physick<sup>1</sup> of Philadelphia, writing over a century later than Sydenham, states that it was the common opinion that the black matter vomited in yellow fever was poured out by the liver, and that it consisted largely of bile that had undergone decomposition.

When we consider that an epidemic of yellow fever was prevailing in Jamaica in 1655, at the time of its acquisition by the British, and that the disease was again epidemic there in 1671, it would be very remarkable if it had not at some time been imported into England or into the continent with troops returning from the West Indies. During the time of which Sydenham writes the English were engaged in campaigns on the continent, and their country was visited by epidemics of bubonic plague, suppurative meningitis, small pox, influenza, typhus fever, and probably of pneumonia. True malarial fevers certainly prevailed there to some extent, and it would not be surprising if a disease of such varied symptomatology as yellow fever and presenting so many points of resemblance to the malarial fevers, should have escaped special recognition, particularly if one bears in mind the fact that they regarded all pernicious types of fever as due to a common cause.

A number of instances are recorded in the literature of the eighteenth century of outbreaks of fevers of different

---

<sup>1</sup>The Medical Repository, New York, 1802, Vol. v, p. 129.

types of malignity on board British vessels carrying troops from the West Indies to Europe and from the coast of Africa to England. It is probable that many of them were outbreaks of yellow fever. Still we hear nothing of black vomit until the later periods, after the disease had been recognized as a distinct entity. Some medical officers tried the bark treatment, found it useless and discarded it. They were afterwards subjected to official criticism for this, and it was said that if they had persisted in its use the mortality would not have been so great. The fact appears to have been that they were dealing with genuine yellow fever of a malignant type, and their deductions were well founded. On the other hand certain medical officers who encountered outbreaks of a milder character, and in which the death rate was comparatively small, persisted in the use of the bark, and were given credit for treating the disease more successfully. We now know that malaria is not a disease that spreads at sea; many of these ship epidemics followed a sojourn in the West Indies; and further, we are told that fever was still present on some of these vessels after their arrival at ports in England. This being the case it would seem very remarkable indeed if the disease had not been communicated to some persons on shore. The explanation might be offered that the mosquito *Stegomyia fasciata* does not occur in England. Granted, but there is no proof that it would not flourish there for a time if introduced during the warm season. The same assertion would be true of Philadelphia, Boston, New York and other cities in the United States where the disease has occasionally been introduced. The extension of yellow fever in such places must depend absolutely upon the introduction of the particular variety of mosquito that conveys the disease from one person to another, for it has been abundantly proven that fomites are entirely innocent of any direct connection with its spread.

Sir John Pringle, in the preface to the edition of his work published in 1768 states that during the three seasons 1755, '56 and '57, before leaving the army he attended military camps in England, and found the diseases of the hospitals

similar to those he had described as occurring on the continent during the former war, but milder in character. He attributes this relative mildness to the nature of the climate and the fact that the troops did not suffer the same hardships that they had been compelled to endure while in actual campaign. In his text he describes yellow fever as it is seen in the West Indies and then remarks<sup>1</sup>; "But, upon this article<sup>2</sup> I received the most satisfaction from Dr. Huck, who having been upon the expeditions to the French and Spanish Islands during the late war, made the following remarks upon the paragraph above: [then quoting from Dr. Huck,] 'Even in the most ardent and worst kinds of yellow fever I think a paroxysm may generally be perceived once in four and twenty hours; for the patient is commonly worse towards evening, or at night. And if the yellow fever was to be distinguished in its beginning, from the common remitting or intermitting fever which was so fatal to our Army, it was only by all the symptoms running higher, and by a greater degree of the fever when one might have expected freer remissions. Both fevers began with nearly the same symptoms; sometimes though rarely, with a shivering. But whenever the fever ran high with a burning heat, violent pains of the head and loins, profuse sweats without relief, redness and burning pains of the eyes, inflamed countenance, watchfulness, anxiety, oppression and burning pains about the praecordia, frequent vomitings of green or yellow bile, or (what I think was rather worse,) a constant retching to vomit without bringing up anything, or vomiting the drinks only, one might almost certainly foretell the yellowness; and if this appeared on the second, third or fourth day, the disease was generally mortal. I have often seen patients labouring under the most of these symptoms relieved by early evacuations, and the fever brought to intermit.

\* \* \* \* \*

" 'And I have known some of these very patients, who were so well as to go abroad on the second or third day after, and

<sup>1</sup>Rush's *Pringle*, Philadelphia, 1812, p. 176.

<sup>2</sup>On the Remitting and Intermitting Fever of the Camp and Cantonments.

who continued well for four or five days; but on committing some error, such as exposing themselves too much to the sun, were again seized with the same symptoms, and died on the fourth or fifth day, with their skin tinged of a deep yellow or copper color. Hence I am apt to think that these are different degrees of the same disease, and that it sometimes depends upon the manner in which the patient is treated in the beginning, whether he shall have the yellow, or only a remitting or intermitting fever.'"

I have quoted this at length because his classical description of the symptoms of the disease shows that he was a close and careful observer, and it is certainly interesting to learn that he regarded the bilious remitting fever as simply a milder form of yellow fever. Dr. Benjamin Rush adds in a foot note: "There can be no doubt of the truth of this opinion from Dr. Huck, a physician whose talent for observation and discrimination were well known to the editor," (Dr. Rush.) It would certainly seem then that bilious remittent fevers, epidemic in character and accompanied by jaundice, of short duration, occurring on vessels, in seaport towns and along the lines of travel from them, are closely related to, and probably identical with yellow fever.

Pringle<sup>1</sup> refers to Thomas Bartholin's account of a malignant fever at Copenhagen in the fall of 1652, after an *unusually hot and dry summer*. Bartholin, upon dissecting the bodies, *always found the stomach and duodenum inflamed or mortified*.<sup>\*</sup> No one can doubt the significance of these pathological findings, and if such fevers occurred today, at the same season of the year, in a seaport town of the United States, a diagnosis of yellow fever would probably be made.<sup>2</sup>

According to Noah Webster<sup>3</sup> it is related by Livy and Polybius that in the autumn of the year 213 B. C., the Roman, Carthaginian and Sicilian armies at the siege of Syracuse

<sup>1</sup>Rush's Pringle, Philadelphia, 1812, pp. 169-70.

<sup>2</sup>In a foot note Dr. Rush acknowledges the sameness in the symptoms and pathological findings with American yellow fever.

<sup>3</sup>Epidemic and Pestilential Diseases, London, 1800, pp. 71-73. Vol. I.

<sup>\*</sup>The writer's italics.

were attacked by a pestilence which caused a remarkable mortality among the troops, especially among the Carthaginians who were encamped near a marsh or low ground. In the same year a severe pestilential epidemic prevailed in Rome, and the latter was the bilious plague. He remarks that "the fever in Baltimore in 1797, began in the form of a *bilious remittent*, and continued in that form for many weeks, before it assumed the symptoms of a malignant yellow fever."

One can hardly believe that malarial fever would have been so excessively fatal as the epidemic at Syracuse, and the proximity of marshes could exert no effect upon the prevalence of bubonic plague or typhus fever. The presence of that plague of armies, typhoid fever, seems to be indicated by the statement that some of the cases were long drawn out, but bilious symptoms are not of frequent occurrence in this disease.

Solomon de Monchy,<sup>1</sup> city physician of Rotterdam, Holland, wrote: "XXVI. The putrid fever is easily known by a violent pain, especially in the forehead, back, loins and knees; sudden delirium; a bitter taste in the mouth, or like that of rotten eggs; a fetid breath; extreme thirst; burning heat; great pain and oppression in the stomach; a nausea; violent retchings, and casting up sometimes a yellow, black, green, bilious or other corrupt matter; sudden discharges of very fetid excrements, with more or less pain in the bowels." After four years service with the allied army of Germany and the Netherlands, where he was necessarily brought into contact with British surgeons who had served in the West Indies, he asserts that the same putrid fevers that occur in the latter locality also appeared in his own country "on the occurrence of the same causes." It is remarkable that among the antecedent causes he first mentions *heat*. He declares that in Holland these same putrid fevers that occurred in the West Indies, committed the most dreadful havoc. As an instance he mentions a corps, consisting of four battalions of English

<sup>1</sup>An Essay on the Causes and Cure of the Usual Diseases in voyages to the West Indies. London, 1762.

soldiers cantoned at Zealand during the war just ended, scarce a seventh part of them. he says, were fit for duty, and the Royals in particular, at the end of the campaign, had but four men who had never been ill.

Webster<sup>1</sup> again cites: "In autumn 1753, after a dry season, in Rouën (France) there appeared an epidemic sickness, which seized both sexes with chills, lassitude, loss of appetite, slight pains in the arms and legs. These symptoms were followed by bilious looseness, nausea and vomitings. Most patients bled at the nose, frequently in small quantity. The headache then became violent, with a small hard pulse, a high fever followed. The region of the stomach and hypochondria was tumefied; this symptom was succeeded by a tension of the belly and a slight delirium followed. The tongue was brown or black. Death followed on the fifth, seventh or eleventh day."

John Huxham<sup>2</sup> tells us: "The highly putrid, malignant, and even petechial fevers many times arise from mere antecedent acrimony of the blood, agitated by supervening fever, yet generally the pestilential and petechial have their origin from contagion."

"In these fevers the pulse is tense or hard but commonly quick or small, though sometimes slow and seemingly irregular for a time, and then fluttering and unequal. The headache, nausea and vomiting are much more considerable, even from the very beginning. Sometimes a severe fixed pain is felt in one or both temples, or over one or both eyebrows, frequently in the bottom of the orbit of the eyes. The eyes always appear full, heavy, yellowish, and very often a little inflamed. The countenance seems bloated and more dead than usual."

"The prostration of spirits, weakness and faintness are very often surprisingly great and sudden, though no inordinate evacuation happens; and this too, sometimes when the pulse seems tolerably strong."

---

<sup>1</sup>Philadelphia Transactions, Vol. 49.

<sup>2</sup>An Essay on Fevers, John Huxham, M.D. London, 1782, pp. 92-112 et seq.

"Few or none of these fevers are without a sort of lumbago or pain in the back and loins; always an unusual weariness, or soreness is felt, and often much pain in the limbs. Sometimes a great heat, load and pain affect the pit of the stomach, with perpetual vomiting of porraceous or black choler, and a troublesome singultus; the matter discharged is frequently of a very nauseous smell."

N. B. Singultus is a grave symptom in yellow fever and usually portends death.

Dr. Rush<sup>1</sup> describes a form of bilious remitting fever that occurred in Philadelphia during the summer and fall of 1780. He notes that mosquitoes were uncommonly numerous this year and the disease was almost entirely confined to within a few streets of the Delaware river. In several cases he noticed that the fever was succeeded by jaundice. Nausea was invariably present and sometimes vomiting. Death was often preceded by a profuse hemorrhage from the nose, mouth and bowels. People who refused to lie in bed either died or underwent a slow recovery. By the people this disease was called break-bone fever. It is here worthy of remark that during the same summer an epidemic of yellow fever broke out in Cadiz.

Dr. George Wallis<sup>2</sup> of New York, wrote in 1794 of Remittent fever as follows: "Pain of the head, back and limbs; the eyes are generally suffused with a yellow color, and that diffused over the whole body not infrequently. Sometimes fatal in the second exacerbation or remission. Sometimes called bilious remittent fever from the vomiting of bile and yellow coloring of the eyes and skin."

"In hot marshy countries they are endemic and with us and in other parts of Europe they occasionally become epidemic towards the latter end of autumn. Causes—said by some to be the same as bring on continued, inflammatory or putrid fevers \* \* \* \* \* if attended

<sup>1</sup>Medical Inquiries and Observations, Benjamin Rush, M.D., Phila., 1794, Vol. I, p. 123.

<sup>2</sup>The Art of Preventing Disease and Restoring Health. New York, 1794.



with great debility—lowness of spirits—nausea—oppression—vomiting—coupled with discoloration of the skin, and languid pulse; its belonging to the putrid class is indisputable.”

“Varieties—Bilious, intermittent fever. Attacks generally in the middle of August and is attended, beside the other symptoms, with violent pain of the head, and often with delirium, which symptoms continue in the night, vanish in the day time, after sweating, a hemorrhage or looseness. In the beginning there is frequent nausea, bilious putrid vomiting, and in the end oppression.”

“Putrid class—Marsh remittent fever.

This is the bilious or putrid fever of the low marshy countries described by Sir John Pringle.”

“Happens in moist and warm countries, coming on in July or August. Bears bleeding very indifferently, and should rather be treated in the evacuating and strengthening method.” Among the preventive measures he advises smoking tobacco.

“Putrid or sanguineo-putrescent fever.”

Among those most subject to this disease he mentions “such as labor severely and live in a state of poverty; the luxurious and indolent; the pensive and melancholic; those who sit up late;<sup>1</sup> and those of cold phlegmatic constitutions.”

“In this fever the heat of the body is intense, remittent, the pulse intense, small and unequal. \* \* \*

extreme weakness and prostration of strength, and that often very sudden, the patients are dejected and forbode the worst consequences—they are oppressed with nausea and vomiting of dark-colored bile<sup>2</sup> pain of the head and temples—have their eyes inflamed, full, heavy—and a fixed pain often severe, over both eyebrows and at the bottom of the socket, their complexion of a dingy hue—their breathing is difficult, interrupted by sighing—and the breath strong or fetid—they are troubled with pains in the stomach, back and limbs \* \* \*

\* \* \* the tongue at first is white, afterwards black and

<sup>1</sup>Stegomyia bites in the early morning and from 3 P. M., until 10 P. M.

<sup>2</sup>Black vomit?

dry—the lips and teeth covered with a thick, foul sordes—the urine in the beginning is of a pale color, but in progress of the disease very red, nay, sometimes black, dropping down a dark colored sediment like soot—the sweats are fetid, and frequently appear tinged with blood<sup>1</sup>, the stools smell offensively, are sometimes livid, black or bloody—small livid spots like flea bites, called petechiae, and if broader, vibices, make their appearances—also hemorrhages, apthæ, ulcerations of the fauces, and hiccough, and fetid, sanguinary, dysenteric affections,<sup>2</sup> probably from internal ulceration and mortification, determine hastily the fate of the patient.”

“Causes. Those which are remote or inducing are said to be feeding too much on animal food, particularly fish—eating constantly as the sailors<sup>3</sup> do, salted and half-corrupted flesh and drinking putrid water \* \* \* \* \* corrupted fruit, moist southerly winds, preceded by great heat—vapor of stinking waters—or from fens nearly dried—or from putrid animal or vegetable substances—the stagnant and foul air of hospitals, ships, prisons and workhouses—feeding on corrupted grain—contagion—or any kind of putrid effluvia<sup>4</sup>—for these dispose the fluids (of the body) to become putrescent.” He states also that dissections of those who die of this disease show the brain and viscera, particularly the stomach and intestines, in an inflamed and often in a mortified state. \* \* \* “Sometimes there will occur violent vomiting, which in this fever is not unusual. \* \* \* Eruptions of different colors, red, purple, black, dun or greenish, called petechiae, strike out sometimes towards the close or earlier.”

He is very clear in his descriptions of the various forms of intermittent fever, and it is noticeable that he makes no mention of jaundice among the symptoms of this affection.

<sup>1</sup>In yellow fever the perspiration is often tinged with bile.

<sup>2</sup>Yellow fever frequently terminates with numerous copious bloody discharges.

<sup>3</sup>Note the reference to seafaring men.

<sup>4</sup>Dr. Benjamin Rush attributed the outbreak of yellow fever in Philadelphia in 1793-4 to essentially the same causes.

There can be no doubt that the above description of the various types of remittent fevers includes typhus and probably typhoid fever, but it also includes another fever of the remittent type in which jaundice is a fairly constant symptom, and in which vomiting of dark material and dark or bloody evacuations from the bowel were of frequent occurrence, and we are told that post-mortem examinations revealed inflammations of the stomach and intestine. Such lesions do not belong to typhus fever from which this class of cases is clearly demarcated, notwithstanding that disease was included among the so-called putrid fevers.

Let us compare the above symptoms with a description of genuine yellow fever by one who has studied this disease for years in the West Indies, over a century and a half ago.<sup>1</sup>

"The French call it *La Maladie de Siam*, from its being frequent in the Kingdom of Siam, in the East Indies, which is situated between the tropics near the same latitude with the West India Islands."

"Occurs at all seasons" but is more severe in very hot seasons." He gives the symptoms as follows: "faintness, sickness at the stomach, mostly with a giddiness in the head; soon a small chilliness and horror, very rarely with a rigor, soon followed with pains in the head and back. Flushing of the face, inflamed redness and burning heat and pain in the eyes; great anxiety and oppression about the praecordia are the pathognomonic symptoms, especially when accompanied with sickness at the stomach, violent retchings, *bilious yellow vomitings*\* and great anxiety with frequent sighing. Pulse very quick, high, soft and sometimes throbbing, never hard; sometimes quick, soft, low and oppressed; a quick, full and sometimes a difficult respiration; the skin very hot, sometimes dry; more frequently moist.

"In the latter stages of this fever blood frequently flows not only out of the nose and mouth but from the eyes and

<sup>1</sup>Observations on the Epidemical Diseases of the Island of Barbadoes by William Hillary M.D., London, 1759.

<sup>2</sup>In Barbadoes.

\*The writer's italics.

even through the pores of the skin<sup>1</sup>. Great quantities of black blood frequently voided, both by vomiting and by stool with great quantities of yellow and blackish, putrid bile. The urine may be almost black and mixed with a considerable quantity of half dissolved blood. Livid spots may appear in many parts of the body, especially about the praecordia."

Dr. Henry Warren<sup>2</sup> states that this malignant fever (yellow fever) had been most commonly mistaken for a bilious fever. \* \* \* \* "It is of the pestilential kind and resembles very nearly the pestilential fever described by Dr. Sydenham, which continued for some time after the plague of London. The French call it sometimes *La Maladie de Siam*, from a country of that name in the East Indies, where it is a constant inhabitant."

In this connection we note also that Noah Webster<sup>3</sup> observed a century ago: "The pestilential fever in America is after all called a *new* disease although it is as old as history;" and in writing of the East Indies: "In 1771 disease was added to the calamities of the miserable inhabitants, a million of whom were supposed to perish by the bilious plague."

Dr. Chevers<sup>4</sup>, under the head of Indian Relapsing Fever, refers to Mr. Jameson's report on Cholera in which he narrates an outbreak that ravaged Upper India in 1816, after an extraordinarily dry and hot season followed by excessive rainfall. It appeared in August and raged epidemically in every town and city between Putna and Seharunpore in the shape of bilious remittent fever of a violent inflammatory type, accompanied, like the yellow fever of the West Indies, by a suffusion of the skin. It tended to terminate fatally at the end of two or three days. "It seized equally Europeans and natives, and as readily entered the open and spacious house of the officer and civil servant as the crowded barrack of the soldier. The mortality in the largest cities was very great. In a battalion

<sup>1</sup>Bile stained perspiration.

<sup>2</sup>A Treatise Concerning the Malignant Fever in Barbados, London, 1740.

<sup>3</sup>A Brief History of Epidemic and Pestilential Diseases. London, 1800, pp. 155 and 421, Vol. I.

<sup>4</sup>A Commentary on the Diseases of India. Norman Chevers, Dep.Surg. Gen. of the Indian Army, London, 1886, p. 97.

of 648 strong at Allahabad 305 were attacked during one month (October.) The disease began in August, was at its height in September and October, and ceased with the setting in of cold weather in December. At Cawnpore 8 or 10 men died daily during September and October. Ten regiments lost nearly 400 men." Dr. Chevers insists that these were cases of Indian relapsing fever. Again he quotes Dr. John Macpherson to whom a Dr. Murphy had written during the Burmese war in 1852-3 insisting that a disease which prevailed in the European force in Burmah was perfectly identical with true yellow fever. Dr. Murphy had, previously served with the troops in Africa and the West Indies. Dr. Macpherson informed him that in a pamphlet written in 1856, he had stated "Cases do occur in which there is much yellow suffusion with a certain amount of black vomit, and such cases I have seen in Calcutta."

More recently we learn<sup>1</sup> that a number of cases of fever occurred in 1881 in the District of Wardha, India, among a certain section of the population. They were characterized by intense headache, high fever, bleeding from the nose, stomach and bowels, vomiting of bile, jaundice and death. All cases did not result fatally. The disease was regarded as a new one, and an assistant surgeon is said to have made a diagnosis of yellow fever, for which there seems to have been ample justification, particularly if it be true that the disease was formerly endemic in Siam. These cases are mentioned in connection with malarial fevers, in considering the pathological anatomy of which the author makes the singular statement that in fatal cases of acute malarial poisoning the parasites seem to *disappear from the spleen soon after death*.\*

Schotte<sup>2</sup> published in 1782 a treatise on an epidemic fever which raged with great mortality at Senegal in the fall of the year 1778. It was accompanied by the characteristic yellowness, black vomit, hemorrhagic discharges and bleeding from the gums. From his clinical description and the suggested

<sup>1</sup>Joseph Fayrer in Albutt's System of Medicine, Vol. II, p. 321, 1st Ed.

<sup>2</sup>A Treatise on Synochus Atrabiliosa, by J. P. Schotte, M.D., London, 1782

\*The writer's italics.

manner of introduction from the adjacent Island of Gorée it appears to have been a malignant type of yellow fever. He called it *Synochus Atrabiliosa*, reported several secondary attacks (relapses?) and stated that the infections were accompanied by abscesses of the liver,<sup>1</sup> but this is negatived by a subsequent statement that he had "not opened any of the bodies of the dead"<sup>2</sup>. The deduction was evidently drawn from the clinical symptoms of epigastric pain with the swollen condition and firm consistency of the liver, and from the fact that abscess of the liver did develop in one case after recovery from the attack.

Similar secondary attacks, all occurring within two months of the primary one, are reported by Dr. Ralph who served in Barbadoes during the epidemic of 1816.<sup>3</sup>

Dr. Fergusson records the conveyance of yellow fever from the coast of Guinea<sup>4</sup> to the West Indies on a transport, in 1815—a fact of some interest.

In 1827, while yellow fever was prevailing in Jamaica, an outbreak of fever appeared in Dublin. A diagnosis of yellow fever was made but it was disputed on the ground that the climate of Ireland was not sufficiently hot in summer to generate the yellow fever poison. As Dublin was a large garrison town it would be of interest to know whether or not the troops had recently returned from the West Indies or Africa, and if so, whether any cases of fever occurred en route.

In discussing the outbreak Dr. Stokes<sup>5</sup> states his belief that these cases were identical with tropical yellow fever and cites the same opinion expressed by Dr. Graves. They occurred during an outbreak of typhoid fever<sup>6</sup> and he says that in this group of cases the most prominent symptoms of tropical yellow fever were present, viz: "black vomiting, epigas-

<sup>1</sup>A Treatise on *Synochus Atrabiliosa* by J. P. Schotte, M.D. London, 1782, p. 59.

<sup>2</sup>Loc. cit. p. 149.

<sup>3</sup>Medico-Chirurgical Transactions, Vol. VIII. London, 1820, p. 585.

<sup>4</sup>Loc. cit. p. 108 et. seq.

<sup>5</sup>Lectures on Fever, Wm. Stokes, M.D., Edited by D. Moore, London, 1874.

<sup>6</sup>Probably also disseminated by troops returned from abroad.

tric tenderness, jaundice and enlargement of the spleen. The condition of the liver and other organs at autopsy exactly corresponded with those found by Dr. Lawrence, an American physician, in cases of genuine yellow fever."

We know as a matter of fact that here in the United States, yellow fever has been time and again called bilious remittent fever, until the occurrence of a number of fatal cases with black vomit proclaimed the true nature of the disease. There is good reason to believe that with the approaching complete control of yellow fever, the old time bilious remittent fever will become much less frequent in the United States at least.

Recent experiments have shown that genuine yellow fever may be so mild in character that no man, no matter how extensive his experience may have been, would dare diagnose it as such, unless he knew the disease to be prevailing at the time. Such cases presenting at the beginning of an outbreak would render it extremely difficult or impossible to trace the origin of the severer cases occurring later. So far as I know *stegomyia fasciata* has not been noted as occurring in Great Britain or Central Europe, but that only goes to show that yellow fever cannot propagate in those latitudes unless the insect itself be introduced at the proper season, and along with the infection; the latter in the bodies of individuals suffering with the disease, or in mosquitoes of this genus that have fed upon patients during the febrile stage of their attack. There is no record as yet, of the presence of this insect in Philadelphia, New York and Boston, and numerous other places north of Virginia and Kentucky<sup>1</sup> in the United States, where severe epidemics have been reported. The explanation appears to be that the insect in question does not survive the winters of northern latitudes, but if it be introduced during a warm season, it may propagate rapidly and become very numerous. We know that the eggs, if dried after they are hatched, retain their vitality for over three months, and it is possible that they might survive through a long winter.

---

<sup>1</sup>Verbal communication from Prof. L. O. Howard, Entomologist to the United States Department of Agriculture.

It would not be unreasonable to suspect that yellow fever was known to the ancients. In his catalogue of diseases that Hippocrates knew, Le Clerc<sup>1</sup> mentions one in which there was "burning fever with vomiting of blood and great loss of blood by stool."

John Millar,<sup>2</sup> a careful and skilled observer, whose writings have been much quoted, wrote in the early part of the eighteenth century: "A fever prevailed among the soldiers and sailors employed in the West Indies from the year 1744 to 1748. It was similar to that described by Hippocrates, Willis, Sydenham, Morton, Diemerbroeck and Sir John Pringle. It began in the middle of autumn and disappeared about the middle of winter."

"Hippocrates described a remittent fever occurring in Greece, of which there were thirty-five cases and fourteen deaths. His treatment was simple domestic management."

Prospero Alpinus who wrote about the beginning of the seventeenth century, describes a fatal epidemic fever that prevailed at Alexandria in Egypt during the hottest months of the year.<sup>3</sup> It began with nausea, great sickness of the stomach, extraordinary inquietude, and a vomiting of an acrid bile; many had bilious and putrid stools. He attributed it to importation from Greece, Syria, and the more southern parts of Africa.

Josiah C. Nott,<sup>4</sup> after extensive reading and profound study of the subject of yellow fever appears to have been satisfied that the disease existed upon the continent of Asia, for he says; "We are led to conclude from the mass of evidence on this point, that yellow fever varies much as to type in different localities; in extremely hot climates for example, as in Asia and Africa, the excitement is more intense, and the brain is more uniformly and violently affected, etc."

---

<sup>1</sup>History of Physick by Le Clerc; translated by Drake and Baden, London. 1699.

<sup>2</sup>Observations on the management of the Prevailing Diseases in Great Britain, particularly in the Army and Navy, John Millar, M. D. Lond. 1729.

<sup>3</sup>Quoted in Rush's Pringle, Philadelphia, 1812, pp. 172-3.

<sup>4</sup>Yellow Fever Contrasted with Bilious Fever, New Orleans Medical and Surgical Journal, Vol. IV, No. 5, March 1848, p. 586.



The following reference to bilious remittent fever and jaundice by Dr Donald Monroe,<sup>1</sup> a physician who served with the British Army in Germany is of interest:

"ON THE INFLAMMATORY FEVER."

"As the summer advanced this fever was often accompanied with bilious symptoms, with sickness and vomiting of bilious matter, and very frequently with a purging; towards the end of the summer it ceased, and was succeeded by the bilious remittent fever. And it was no uncommon thing to see those fevers, which were originally of an entirely inflammatory nature, after the sick had been some days in a crowded hospital partake a good deal of the nature of malignant fever or be changed entirely into it."

"OF THE JAUNDICE."

"In the end of the campaign of 1760, after a continued rain for many weeks, the jaundice had been very frequent, and in a manner epidemical among the troops, for sometime before they left the field; and in passing through Munster, about the end of December, I observed several ill of that distemper in the hospital and met with a few cases of the kind in the hospitals at Paderborn in January, 1761.

"In the beginning of this disease, patients usually complained of sickness, heat, thirst and other feverish symptoms; and some had vomiting and pain in the stomach for a day or two before the jaundice appeared; the urine was always of a deep color from the first; and about the second or third day the skin and the whites of the eyes began to be tinged with a yellow color, attended with the common symptoms of this disorder.

"Such was the manner in which the jaundice began in those who were taken ill in the garrison."

It is not intended to contend that any of the groups of cases recorded by the older observers were actually and unmistakably yellow fever, yet the former history of the disease is wrapped in such obscurity that the possibility is well worth

<sup>1</sup>An Account of the Diseases in the British Military Hospitals in Germany from 1761 to 1763, by Donald Monroe, M. D., London 1764

considering. Many of these writers were acute and careful clinicians and laborious and painstaking workers, and their records of the clinical aspects of their cases must be accepted as far as they go; they are as accurate as it was possible to make them at that time. Let us suppose, for the sake of argument, that they were actually dealing with yellow fever as we see it today. How would they have recorded it? The answer must be, precisely as they have recorded a large number of their cases occurring in epidemic form, and some of them had already seen yellow fever in the West Indies and elsewhere.

It is necessary to bear in mind that they regarded all fatal fevers as putrid, malignant or pestilential, and these were generally attributed to a common cause, viz., fermentation. They believed that in the malignant fevers, decomposition of the blood, bile and tissues took place, and the vomitings and evacuations as well as the perspirations, were conservative efforts on the part of nature to rid the body of noxious substances and the products of this decomposition. Hence black vomit and tarry evacuations from the bowels were believed to contain decomposed bile, blood and even liver substance, so that they were spoken of generally as being of a bilious or putrid character. All the malignant types of fever, smallpox, typhus, severe typhoid, pernicious malaria, yellow fever, suppurative meningitis, etc., were therefore putrid fevers, among which yellow fever, if present, can only be differentiated by its epidemicity, short duration, high mortality rate and the accompanying jaundice.

The occurrence of epidemic malarial fever with jaundice is open to serious doubt, indeed there is reason to believe that early jaundice is a rare symptom in that disease, the sallowness which occurs later being due to cachexia or the deposition of pigment. On the other hand it is a constant and almost invariable symptom in pronounced cases of yellow fever. The explanation is a simple one. In the latter disease an intensely powerful toxin circulates in the system, and this toxin may be said to show a selective action upon the paren-

chymatous cells of the liver, in consequence of which they undergo marked cloudy swelling followed by granular and fatty degeneration. In the early stages the organ is intensely congested, but much of the blood is displaced after cloudy swelling has set in. The mutual pressure of the swollen cells arrests the flow of bile in the ultimate bile capillaries, as a result of which the biliary coloring matter is absorbed by the lymphatics and there occurs an early jaundice.

There can be no such explanation of the occurrence of jaundice in acute fatal malarial intoxication, for the parenchymatous cells of the liver are never affected to any extent approaching the degree of degeneration found in fatal forms of yellow fever. That jaundice may be present in malarial cases goes without saying, but there is no apparent reason why it should be present constantly, and at an early period in the disease. I was present while in Havana, at the autopsy upon the body of a man who had died of pernicious malarial fever, and who was intensely jaundiced. An advanced atrophic cirrhosis of the liver afforded sufficient explanation of the bile staining of the skin and tissues. The case was not suspected of being yellow fever, for a diagnosis of malignant jaundice, or acute yellow atrophy, had been made during life.

The records of the Civil War show conclusively that attacks of fever with accompanying jaundice may occur among troops on campaign in places where, and during seasons when, both yellow fever and acute malarial infection can be absolutely excluded. In one instance at least, the number of persons attacked, justified the use of the term "epidemic" in reporting them<sup>1</sup>.

The cases were all mild in character and none of them resulted fatally. They are probably to be attributed to some form of intoxication resulting from errors of diet, exposure or other incidents of camp life.

Fortunately the future solution of the problem of epidemic bilious remittent fever is easy, for careful blood examinations will always determine the presence of the malarial parasite

---

<sup>1</sup>Part Third, Medical History of the War of the Rebellion, p. 875.

when it is the cause of the fever. The occurrence of combined infection may also be determined from the presence of malarial disease in the locality, by the use of the Widal test, etc.

In connection with these remittent fevers Osler<sup>1</sup> makes the significant statement that "the entire group of cases included under the terms remittent fever, bilious remittent and typho-malarial requires to be studied anew."

Strumpell<sup>2</sup> says "but it is to be noticed that many types of disease which physicians in the tropics describe as malarial affections have not yet been proved to our satisfaction to have an actual identity of origin with the common intermittent fever. \* \* \* \* \* Gastro-intestinal symptoms may predominate; or there may be such grave nervous symptoms as coma, delirium and convulsions; or there may be jaundice, hematuria, and even a general hemorrhagic diathesis."

Since the first recorded appearance of the disease in the United States in 1693 at Boston, it has been imported a great many times and has caused the loss of many thousands of lives and of millions of dollars in money. In 1793 it proved a veritable plague in Philadelphia, and again in Baltimore a few years later. In 1853 and 1855 it devastated many cities in the southern states, New Orleans in particular; it flourished again in 1867, 1873, 1878 and 1897, not mentioning innumerable instances of smaller outbreaks that were checked by quarantine measures, the exodus of non-immunes and the onset of cold weather. The frightful picture presented by severe cases of this disease and the mysterious manner in which it spread, invading houses whose occupants had secluded themselves for weeks to avoid contagion, invested it with a peculiar horror. From the fact that as a rule the first cases appeared to originate in the vicinity of docks, wharves and shipping, many of the best authorities believed that it was generated *de novo*, in the presence of water and decayed wood or vegetable matter. A few believed that it was imported from abroad, but this was often very difficult to prove, because the first

---

<sup>1</sup>Practice of Medicine, 1898, p. 213.

<sup>2</sup>Practice of Medicine, American Edition, 1892, p. 95.

cases, if they happened to be mild, escaped recognition; or if they were more marked and recovered without black vomit, were apt to be regarded as cases of bilious remittent fever. It is a matter of record that in some instances where a case was perfectly typical and death ensued, the true character of the disease was concealed by the physician, as a matter of policy and to avoid creating a feeling of alarm. Physicians were perplexed to find that while in some cases persons appeared to contract the disease by coming into contact with the patients, there were other and more numerous instances in which persons maintaining close and intimate relations with patients suffering with the disease, were not affected. Again the disease attacked persons living in adjoining houses and who neither approached the patient nor entered the building in which he lay. It was also observed that patients could be removed to certain localities and be treated there without the slightest danger of the occurrence of secondary cases. Observation showed that the infection appeared to be one of locality; that it seemed to cling to certain buildings or to certain districts rather than to individuals, and that its extension from these foci was slow and irregular.

Dr. Benjamin Rush<sup>1</sup> after investigating the Philadelphia outbreak of 1793 declared in the following year that it originated from some putrid coffee that had been discharged from a vessel. He said that he had met several cases in which it had produced fever on the same day, and had heard of two others where sickness, fainting and fever had occurred within an hour of exposure.

Dr. Ramsey, of Charleston, who wrote a history of five outbreaks of the disease<sup>2</sup> said: "In all these instances it was said to have been imported. But it never spread in the country, though often carried there by persons who died out of Charleston." He concluded by saying: "We have no reason to believe that yellow fever was either imported among us, or that it is communicated by contagion."

---

<sup>1</sup>A Series of Letters and Documents relating to the late outbreak of Yellow fever, published by the city of Baltimore, 1820.

<sup>2</sup>Ibid.

Doctors Taylor and Hansford<sup>1</sup> of Norfolk, Va., wrote of the epidemic of 1800: "in its malignant form it always originated on the banks of the river or on low, new made ground, and in houses built on the docks. \* \* \* We know of no instance in which the disease has been communicated by contagion."

Dr. Vaughan<sup>2</sup> of Wilmington, Del., writing in 1803 of the outbreak of 1802 in that city, called attention to the relative danger in visiting infected districts during the night time and during the day. According to him, "many persons who had frequently visited that district during the day time and in fair weather without injury, sickened by a single exposure in the night time."

Drs. Rush, Caldwell and eleven other physicians of Philadelphia, stating the results of their researches and experiences with yellow fever, for the benefit of the state legislature, reported<sup>3</sup> "we believe the fever which lately prevailed in our city to be the bilious remitting fever of warm climates." A year later Dr. Rush changed his opinion, and he afterwards published a retraction of his former statement that the disease spread by contagion.

In a description of a very malignant outbreak in Philadelphia in 1802<sup>4</sup> there appears the following statement: "It was confined nevertheless to the same parts of the town as in former years, and wholly to houses promiscuously situated at the heads of warves, in the south part of town, and it was remarkable that if a patient under the disease was carried out of the range of the morbid atmosphere, into the healthy part of the town, attended by persons there resident, the disease was not communicated in a single instance, but not so if he remained on the spot where he took the disease."

One could hardly desire any clearer proof of the necessity of the mosquito for the propogation of this disease. *Stego-*

<sup>1</sup>A Series of Letters and Documents relating to the late outbreak of Yellow Fever, published by the city of Baltimore, 1820.

<sup>2</sup>Ibid.

<sup>3</sup>Ibid.

<sup>4</sup>New York Medical Reporter, Vol. VI, pp. 338-9.

*myia fasciata* is, though not exclusively so, a house dwelling and house breeding insect; when it is introduced by vessels it necessarily becomes most numerous in the vicinity of the wharves and shipping, and its spread throughout the town is more or less irregular, depending upon the temperature (which determines the rate of its multiplication,) and the distribution of the dwellings, i. e., whether they are isolated and scattered or aggregated closely together.

For centuries the opinion has generally prevailed that yellow fever like malaria was transmitted in some mysterious way through the atmosphere, and medical literature teems with evidence of the non-contagiousness of the disease, while at the same time it was just as certainly apparent that one or more visits to a patient, in certain localities, usually resulted in infection. Opinion has been more equally divided as to whether the infectious agent was transmissible by means of garments or articles of bedding; within the last five years soiled clothing belonging to a healthy individual and some innocent cigarettes packed beneath false bottoms in two trunks have been accused of infecting a town.<sup>1</sup> In the light of our present knowledge of the manner in which the disease is transmitted, and of the necessary period of incubation or development within the body of the mosquito, it is quite clear from the facts reported that the town was infected prior to the arrival of the steamer which carried the trunks. The steamer arrived at Key West on the night of August 14th and the trunks were opened on the 15th. Two persons who handled the contents of these trunks came down with yellow fever, one on the 24th and the other on the 26th, the supposed periods of incubation being nine and eleven days respectively. The testimony of Dr. Sweating<sup>2</sup> shows that about August 27th there were already existing in the city eleven unrecognized cases and nine foci of infection! No blame can be attached to any one. The officials were zealous, alert, conscientious and faithful in the performance of their duties, but

<sup>1</sup>Eleventh Annual Report of the State Board of Health of Florida; Jacksonville, Florida, March 15, 1900.

<sup>2</sup>Ibid p. 39, et seq.

they were baffled by the impossibility of pronouncing upon mild cases of yellow fever until the disease had gained a foothold.

Of the twenty-two consecutive cases of experimental yellow fever produced recently in various ways by the Board of American Army Medical Officers not one had black vomit, and although some of the cases were severe, none of them died. All of which goes to show that yellow fever is a disease of extremely variable type and often difficult or impossible of recognition; and that in healthy subjects under careful treatment black vomit may be a symptom of quite rare occurrence.

Within the past year Dr. Lewis W. Sambon<sup>1</sup> has written a description of Blackwater Fever that prompts one to wonder whether this might not be a type of yellow fever under the guise of another name. According to his description it appears to differ from the latter disease chiefly in the occurrence of an early and transient haemolysis, a leucocytosis and frequently remissions. It has been called bilious remittent and bilious yellow remittent, terms which have been so often applied to yellow fever. It occurs chiefly in tropical Africa, the southern States of the Union and in the West Indies; it has also been seen in Venezuela, India, Greece, Italy, and other places<sup>2</sup>.

*Stegomyia fasciata* is known to abound in the Southern States, the West Indies and in western and central Africa<sup>3</sup>. This disease is one of moist regions, it is of short duration, occurs in epidemic form, and in its seasonal prevalence it corresponds with yellow fever. Certainly the mosquito or some similar insect is indicated as the probable transmitting agent. The disease is said to be less fatal than yellow fever, and black vomit is very rare, though the vomiting is of a bilious character, persistent and grave. The period of incubation has not been determined, and, although it has been searched for, no specific organism has yet been found.

The differences between yellow fever and blackwater fe-

---

<sup>1</sup>The Practitioner, London, Vol. 66, No. 3, March 1901.

<sup>2</sup>A System of Medicine, Albutt, 1897, Vol. II, p. 43.

<sup>3</sup>Theobald, in the Thompson-Yates Laboratory Reports, Vol. IV, Part I. September 1901.



ver are probably not greater than between the tertian and aestivo-atumnal types of malarial infection.

With the development of the science of bacteriology and the discovery that certain bacteria were the causes of certain specific diseases attention was naturally directed towards yellow fever as affording an interesting and important field for investigation.

In 1885<sup>1</sup>, Dr. Domingos Freire, a Brazilian, announced that he had isolated the yellow fever germ in the form of a micrococcus. This organism was studied and identified by Sternberg in 1887 as the staphylococcus pyogenes albus, a coccus of little importance and wide distribution. Dr. Carmona, of Mexico, advanced a similar claim for another organism in the same year, but that also was disposed of by the same authority.

The most extensive and thorough scientific study of the bacteriology of yellow fever recorded was made by Sternberg in 1888 and 1889.<sup>2</sup> At its conclusion he reported a negative result after the study of forty-two autopsies on typical cases, having made anaërobic as well as aërobic cultures from the organs, blood, urine, stomach and intestine. Tissues were preserved and studied in sections, and the blood was studied in the most careful and painstaking manner. He prepared no less than one hundred and five photographic negatives in the examination of ninety-eight specimens of this tissue. The only organism isolated from the blood in the heart was the colon bacillus, obtained in two out of eight cases or twenty-five per cent.

The recent demonstration of the part played by the mosquito in the transmission of this disease is the result of the continuance of his intense interest in this work. We find the following prophetic statement in a foot note on page 531 of his *Manual of Bacteriology*<sup>3</sup>. While discussing the bacteriology of yellow fever he says: "The possibility, of course,

<sup>1</sup>Sternberg, Report on the Etiology and Prevention of Yellow Fever, 1890.

<sup>2</sup>Ibid.

<sup>3</sup>A *Manual of Bacteriology*, by George M. Sternberg, M.D., New York, 1892.

remains that the specific infectious agent in yellow fever may belong to an entirely different class of microorganisms from the bacteria, or that it may be *ultra-microscopic*\* or not capable of demonstration in the tissues by the staining methods usually employed by bacteriologists."

In the summer of 1897 the scientific world was thrilled by the announcement that Dr. Giuseppe Sanarelli had at last found the specific germ of the disease during the preceding year, while working on the Island of Flores. In the British Medical Journal of July 3rd of that year, the announcement was made, in the news from Rome, that Dr. Sanarelli had discovered the bacillus of yellow fever. In a translation from Sanarelli's own words it quotes him as follows: "the microbe of yellow fever now splendidly presents itself, and is the strangest of all the microbes that are known." In a lecture delivered on the tenth of January, 1897, before the University of Montevideo he stated that he had isolated his bacillus from the second case he met with on the Island. He also made the following significant statement: "I have never met with the bacillus *icteroides* alone, it was at least associated with the colon bacillus, staphylococci or the streptococcus." Now as two of these associated organisms, the colon bacillus and the streptococcus, are inhabitants of the normal intestine, the thought naturally suggests itself; has not also bacillus *icteroides* been derived from the same source? Such indeed seems to have been the case, for a number of instances are now known in which bacilli of the same group have been isolated from the bodies of persons dying from other affections than yellow fever; and the condition of the intestine, viz: that of intense congestion with rupture of the capillary blood vessels so often present in this disease, should facilitate invasion of the body from that canal. Sanarelli's statement that "it is the strangest of all microbes known" shows that he was not familiar with that important American contribution to bacteriology, the hog cholera bacillus, for his bacillus *icteroides* belongs clearly and unmistakably in the same group. Indeed

---

\*The writer's italics.

one of the particular cultures isolated by him, and which the American Commission were fortunate enough to secure, possessed a high degree of virulence and proved to be a perfect type of the hog cholera bacillus in every respect.<sup>1</sup> Its morphology and biology were the same; it was agglutinated with blood that agglutinated the bacillus of hog cholera; and, above all, it produced the typical lesions of hog cholera in the hog. In the smaller animals and in pigeons it caused the same lesions and the same phenomena as *b. cholerae suis*; in short it differed from the bacillus of genuine hog cholera only in that it was obtained from the human being instead of from the hog.

In 1897, Havelburg isolated a colon bacillus which he thought was the cause of yellow fever, and in the same year Wasdin<sup>2</sup> isolated bacillus icteroides from a case of yellow fever at Fontainebleau, Mississippi.

In 1898 and 1899, Wasdin and Geddings reported<sup>3</sup> that they had confirmed the work of Sanarelli, and finally that bacillus icteroides, which they had isolated in over 92% of their cases, was the cause of yellow fever. They stated that they had succeeded in infecting various animals, dogs, rabbits, guinea-pigs, rats and mice with this disease by inoculating them with this bacillus.

In August, 1900, it was first shown<sup>4</sup>, that yellow fever is conveyed by the mosquito, *Stegomyia fasciata*. During the following winter the observations made at that time were abundantly confirmed, and it was also proved that the bedding, clothing and discharges from yellow fever patients were innocuous; it was shown as well that the disease could be transmitted by blood injection.<sup>5</sup> In 1901, Guiteras<sup>6</sup> confirmed the mosquito theory with a record of eight

<sup>1</sup>The Journal of Experimental Medicine. Vol. V, No. 3, Dec. 15th 1900.

<sup>2</sup>The U.S. Marine Hospital Service Report of a Commission appointed to investigate the causes of Yellow Fever 1899, p. 90.

<sup>3</sup>Ibid and Philadelphia Medical Journal, Oct. 27, 1900.

<sup>4</sup>Proceedings of Am. Public Health Ass'n, 28th Annual Meeting, Oct. 1900.

<sup>5</sup>American Medicine, Vol. II, No. 21, November 23, 1901.

<sup>6</sup>Transactions of the Ass'n of American Physicians, Vol. XVI, 1901.

cases and three deaths. I was accorded the privilege of performing an autopsy upon the first fatal case of Dr. Guiteras' series in the fall of 1901. This is the first fatal case of experimental yellow fever on record. It is only necessary to state that the lesions found were the characteristic ones of this disease.

Dr. Caldas of Brazil and Dr. Bellinzaghi of Mexico were in Havana at this time for the purpose of demonstrating the efficacy of their curative and preventive serum for yellow fever. Dr. Caldas claimed to have discovered the specific cause of the disease in the form of a bacillus in the intestine, but he declined to demonstrate his organism for commercial reasons. He secured two non-immune Spaniards and injected his serum in protective (?) doses into both. After the reaction had subsided one of these men was bitten by two of Dr. Guiteras' infected mosquitoes, applied by Dr. Charles Finley, the originator of the mosquito theory of the transmission of the disease. The Spaniard came down promptly in three days and a few hours, and passed through a rather severe attack of yellow fever. As soon as the first man came down the second protected individual lost all interest in the subject and immediately disappeared.

Later in the same year, 1901, it was demonstrated that the blood serum of a yellow fever patient would convey the disease, when injected subcutaneously, after it had been passed through a new Berkefeld filter, which is capable of holding back all known bacteria.<sup>1</sup> This and the fact that it is not present in a large proportion of autopsies, positively excludes the hog cholera bacillus of Sanarelli from consideration as bearing any causative relation to this disease.

Persons who decline to accept the mosquito theory sometimes point to the disappearance of yellow fever from the city of Santiago, Cuba, prior to the demonstration of this theory, as evidence that the disease can be eradicated by ordinary sanitary methods alone. We had often been puzzled to explain the eradication of a disease transmitted solely through

<sup>1</sup>American Medicine, Vol. III, No.8, February 22, 1902, Reed and Carroll.

the mosquito by measures not especially directed against that insect. During my last visit to Havana, in the latter part of the past summer, I had the pleasure of renewing my acquaintance with Captain William H. Block, Assistant Surgeon, U.S. Vols., who had been stationed at Santiago for several years. He was not prepared to accept the mosquito theory to the exclusion of fomites, and asked me how I explained the disappearance of the disease from the city of Santiago? I admitted that I could not explain it without being familiar with the circumstances and local conditions, unless the sick were promptly removed to some point especially located, or at a distance from the city. He informed me that that was precisely what had been done; that all suspected cases of fever had been promptly removed to Yellow Fever Island, one mile across the bay. Some of these proved to be cases of malaria, and after apparent recovery from the infection, a number of them developed typical attacks of yellow fever. We see, therefore, that by the measures adopted infected mosquitoes were largely confined to a limited area, upon an island one mile from the city. This island was accessible only to the sick and immunes, while at the same time, non-immunes were excluded from the city. The disease was finally completely stamped out because (a) susceptible individuals were scarce, and (b) the patients being removed early in the attack, the majority of the insects that became infected by biting them were too far away to inoculate persons living in the city.

While discussing this feature of the subject, I shall, at the risk of being tedious, cite some facts recorded by Dr. T. S. Scales<sup>1</sup> of Mobile, Ala., in connection with the outbreaks of yellow fever in that city during the years 1875, 1876 and 1878. They show in a very striking manner, the value of strict quarantine and sulphur fumigation in handling an epidemic of yellow fever. Both measures protect against the mosquito; the former by diminishing the chances of non-immunes being bitten, the latter by destroying the insects themselves. The results obtained are to be attributed to these

---

<sup>1</sup>Proceedings of the Am. Public Health Association, Vol. VI, 1880.

measures alone, for we know that disinfection apart from fumigation means waste of money in an effort to suppress or control this disease. We can only add to them the following: (a) strict enforcement of the use of mosquito bars and wire screens; (b) reduction of the number of mosquitoes by the use of petroleum, etc., (c) thorough surface drainage and the removal of all standing water from within dwellings or without.

Dr. Scales reports that there were, in his city, in 1875, sixteen cases of yellow fever with seven deaths. The first case appeared September 1st and the last October 20th. In 1876, only two cases occurred, both of them at the Battle House. The measures adopted were rigid quarantine of the patient and the use of disinfectants. At the termination of the attack the infected room, after being subjected to sulphurous acid gas fumigation was closed and kept closed until the advent of cold weather

Please note what follows: In 1878, the first recognized case appeared August 11th and the second ten or twelve days later. The same protective measures being followed only ten cases occurred up to September 22. At this time the Board of Health rescinded the order requiring the quarantine of infected houses. By the end of the year there had occurred two hundred and ninety-seven cases with eighty-three deaths!

Fortunately many of the mosquitoes of the genus *Stegomyia* do not appear to live long enough after biting the patient to be capable of communicating the disease to other individuals. After feeding upon blood they soon proceed to deposit their eggs, and in performing this function or soon afterwards a large proportion of them die. The duration of life of the insect, exclusive of hibernation, is probably not more than seventy-five days under the most favorable conditions. It may be capable of infecting as early as twelve or fourteen days after biting, and may retain its power to communicate the disease until the fifty-seventh<sup>1</sup> day after the first feeding upon a yellow fever patient.

---

<sup>1</sup>See case VI reported by Drs. Reed, Carroll and Agramonte in the Transactions of the Association of American Physicians, Vol. XVI, 1901.

In concluding I will state that yellow fever, as we meet with it, is contracted only through the bite of an infected mosquito twelve days (so far as we know,) or more after feeding upon a patient in the early period of the disease. Experimentally the disease can be produced by the subcutaneous injection of blood or even the filtered blood serum of a patient, provided the material be obtained sufficiently early in the attack.

Notwithstanding the incontestible evidence that there can be no such occurrence as yellow fever produced by fomites many are still unwilling to surrender a theory that has become traditional with them.

Quite recently<sup>1</sup> the Louisiana State Board of Health officially approved a paper by its president in which he takes exception to the idea that yellow fever is conveyed only through the bite of the mosquito. He cites a number of instances, some of them dating as far back as 1853, to prove the contrary. It would be unprofitable and useless to endeavour to obtain the minute details necessary to prove the mosquito theory from the imperfect data recorded at a time when this insect was not considered as a possible factor in the propagation of the disease. Dr. Souchon first cites the cases of four vessels that arrived in port after a sea voyage without having had any cases of fever on board, and in which the fever developed after reaching the U.S. quarantine stations. The evidence he adduces tends only to support the mosquito hypothesis, for the period of incubation of yellow fever being a fixed quantity within certain well defined limits, the cases cited by him simply indicate that the individuals infected were bitten after the arrival of the vessels at the quarantine station. The evidence points decidedly to infection of the quarantine station or port of entry rather than of the vessel. We now know that a number of cases of this disease may occur without its true nature being revealed, until it has obtained a substantial foothold. For absolute safety quarantine

---

<sup>1</sup>Treatment of vessels from Yellow Fever Ports by Edward Souchon, M. D., *Medical Record*, New York, February 8, 1902.

stations, particularly those at southern ports in the United States, should be kept free of mosquitoes, and all buildings used as offices or dwellings should be thoroughly screened with fine-meshed wire gauze.

Attention is invited to the present condition of the city of Havana, from which yellow fever has been completely eradicated by the use of measures directed only against the mosquito, and without any attempt at disinfection of bedding, garments or excreta, for we have no reason to believe that the burning of pyrethrum powder is disinfection in the ordinary sense.

In October 1900 there occurred in that city three hundred and eight cases of yellow fever with seventy-four deaths. In October 1901 there were no cases and no deaths, with a larger non-immune population than ever before.<sup>1</sup> Since September 27th, 1901, no case of yellow fever has developed in that city, a condition unprecedented there for more than a century.

#### A CASE OF ELEPHANTIASIS.



**A** FILIPINO, A. B., aged 24 years; seven years ago, while at work cutting bamboo, a large piece of growth fell on his right foot making a severe wound which did not heal for some days. After the wound had entirely healed, the foot began to enlarge and has gradually increased in size until the present time. Patient has never received any medical treatment for the affection, and would not consent to amputation. The present condition is well shown in the cut.—MELVILLE A. HAYS, *Contract Surgeon, U.S.A.*

<sup>1</sup>Monthly Sanitary Reports of the City of Havana for October, 1901, and for January, 1902.



SOME OF THE EXPERIENCES OF THE UNITED  
STATES NAVY WITH YELLOW FEVER  
ABOARD SHIPS.

By FRANCIS W. F. WIEBER, M.D.

SURGEON IN THE UNITED STATES NAVY.

THERE are stored away among the records of the Bureau of Medicine and Surgery of the U.S. Department of the Navy many valuable professional papers detailing experiences, which, if rescued from obscurity and placed at the disposal of professional men working in the same field as those who gathered them, would be most instructive to the younger members, and of valuable assistance to sanitarians.

With the desire of finding instruction, primarily for myself, among these records I have, thanks to the kind assistance of Surgeon Gatewood, U.S. Navy, the Assistant Chief of Bureau, been enabled to look up recent data on Yellow Fever and have tried to present the facts in such a condensed form, that conclusions may be readily drawn from them.

My conclusions from the study of these reports are the following ones:—

1. Persons on board of a ship anchored some distance from shore, in a yellow fever port, may become primarily infected with yellow fever, without having set foot on shore. (U.S.S. Marion, Resaca, Plymouth, Newark.)
2. The infection thus caused has been traced, directly or indirectly, to the taking in of stores and provisions. (U.S.S. Resaca, Marion, Plymouth, Newark.)
3. Secondary cases have frequently happened on board ships anchored at a considerable distance from shore. (U.S.S. Jamestown, Resaca.) These continued after the ships left port.
4. Epidemics on board men of war have been prevented by

the timely isolation (sending on shore) of early cases. (U.S.S. Monongahela.)

5. In some instances an epidemic has not developed on ships after yellow fever had appeared, even when it was impossible to send the sick away from ship in the very beginning of the attack. (Second outbreak on U.S.S. Monongahela, U.S.S. Lancaster.)

6. First cases have occurred from the 6th-12th day after leaving port. (Cases on U.S.S. Lancaster, Marion.)

7. Transferring a ship's crew from an infected vessel to an uninfected vessel put a sudden end to the epidemic. (U.S.S. Saratoga.)

8. The sick transferred from an infected vessel do not necessarily cause new foci. (Hospital Ship "Illinois".)

9. Freezing a ship for an extended period, combined with repeated fumigations, under special conditions does not necessarily kill the morbid agent. (U.S.S. "Plymouth".)

Before giving a short synopsis of the various reports, I want to allude to the points which give special value to the Naval data in the consideration of yellow fever. Here is a community, brought close to an epidemic focus, but at the same time kept segregated from it more or less according to conditions. Connection with the shore is either entirely or partly cut off. As a rule it is limited to the most necessary intercourse, such as sending ashore for and procuring supplies and provisions, attending to the mail, making official visits, etc., in each case only a few known individuals form the connecting links with the shore. The ship coming from a different section of the world can safely be said to be without the infecting agent at the time of her arrival, except in special cases, and this can only be taken to her from shore through communication established over the water, for as a rule, the man of war never goes alongside of a wharf, in a foreign country, but lies at a considerable distance from shore.

Under these conditions of limited intercourse with the shore, epidemic disease has reached vessels of our Navy and the record of 40% of the complement of a ship taken sick with yellow fever, and of a death rate of 44% of the sick, as happened, on the U.S.S. Jamestown in 1867, while at Panama during the dry

season, furnishes an experience well worth considering and recalling to the minds of naval surgeons. This epidemic on the Jamestown is the one most remote from the present time taken up in this paper and will be first considered, to be followed in chronological order by other experiences.

YELLOW FEVER ON THE U.S.S. JAMESTOWN. (*Surgeon D. Bloodgood, U.S.N.*)—The U.S.S. Jamestown, newly commissioned, described as a roomy, tidy and well ventilated ship, except on her orlop deck, arrived at Panama from San Francisco Nov. 15th, 1866. She was anchored three miles from Panama and one-half mile from Flamenco Island, which is used as a burial place. In connection with the outbreak of yellow fever on board the ship it is stated in the official report by Dr. D. Bloodgood, U.S.N., that two marines belonging to the ship had been detailed for guard duty at the Navy store-house on shore. These two marines were on this shore duty continuously from Dec. 8th to Dec. 19th, 1866. Dec. 19th both returned to the ship. One of them was taken sick on that day and developed unmistakable symptoms of yellow fever. Convalescence commenced on Dec. 27th. During the illness he was kept on the orlop deck, which served as the berthing place for all the marines, who later developed the disease, and where the brig was located. The second case of yellow fever developed in the case of the ship's carpenter, who had also been on shore several days and nights, and on a debauch. He had been brought back to the ship and placed under sentry's charge. A week later he was taken sick with Yellow Fever and died Jan. 4th. These two cases had been undoubtedly infected on shore. The second marine was not taken sick until 33 days after his return to the ship, January 21, 1867.

Twenty-two days after the first case, the third, which was probably the first secondary case, developed, followed two days later by the fourth case and six days later by four new cases in men who had just been released from the cells, "dark and damp abysses of the orlop deck." From this day on new cases were admitted almost daily. Of the first 10 secondary cases, 9 were either marines or prisoners, that had been quartered on the orlop

deck. The tenth case was the ship's surgeon, Dr. Duvall. Later it spread to all parts of the ship.

The surgeon's advice to stop all shore leave, to proceed to a colder climate, to have prisoners removed from the cells, to forbid the men to sleep on the orlop deck or to remain there longer than was absolutely necessary, being unheeded by the commanding officer, the epidemic continued to spread.

On April 2nd, in obedience to orders from the Secretary of the Navy to proceed to sea without delay, the ship left for the north. By that date there had developed 33 cases of Yellow Fever. On her way to San Francisco, where she arrived on June 7th, 66 days out from Panama, 26 more cases followed. The last one occurred May 23d in lat. 22° 35' N., long., 126° W., maximum temperature 72, minimum 68. 21 deaths marked this epidemic.

The successors to the rooms of two officers who had had yellow fever, and one officer occupying the room adjoining that of a yellow fever patient, and communicating with it through an open bulkhead, contracted the infection. Two doctors, two apothecaries and two nurses were stricken.

The ship was ordered to proceed to Sitka for disinfection by frost. Here she remained until May 1st, 1868, at which time she left for Mare Island to be put out of commission.

The following winter she was refitted for sea. Before proceeding south, however, she was steamed. No return of yellow fever followed the cruise south.

The following facts seemed established by this experience:—

Yellow Fever after being once brought on board found a foot-hold and was able to spread without fresh infection from shore. Uninfected *Stegomyia fasciata*, if the cause of the spread, must have been aboard the ship and reached the ship from shore probably by clinging to boats connecting with the shore, and possibly by being carried across the water by wind. These were infected by the first two imported cases. The infection clung at first to the dark, poorly ventilated orlop deck and to the rooms of officers, who had the disease. Persons who were in close attendance on the sick were all infected with the exception of

Assistant Surgeon DuBois, who had had the disease before.

Leaving the infected port did not put a stop to the epidemic.

The ship, after having been frozen out in Sitka, and steamed at Mare Island, had no recurrence of the disease during a future cruise in the tropics.

YELLOW FEVER ON THE U.S.S. RESACA. (*P. A. Surgeon G. A. Cooke, U.S.N.*)—From July 3rd, 1867, to August 22d, 1867. Complement of ship 131. Total number of cases 77, 58% of complement. Total deaths 19, 24% of sick.

The ship arrived at Panama May 4th, 1867. Four weeks later, yellow fever prevailing in Panama, all visiting and intercourse with the city was stopped, by recommendation of the Medical Officer, except upon matters of strict necessity and duty, officers only being allowed to go on shore with instructions to return immediately their business was transacted. June 24th and 25th ship's stores of various kinds were received on board from the naval store-house. On June 24th the only cases on the list were 1 of fistula-in-ano and 1 of abscessus. On June 25th, a case of fever called remittent fever was admitted on the sick list. This case was discharged to duty June 28th. Ten days after the stores had come on board, July 3rd, the first case of yellow fever broke out, in the case of a berth-deck cook. This was followed by another case on the 6th, another followed on the 7th, 4 on the 8th and so forth. July 13th, after 18 cases had appeared, the ship went to sea, headed for San Francisco by way of Acapulco. The officers had been the only persons allowed to go on shore. None of them were seized with the disease. The fever attacked principally those persons who were mainly engaged in their duties on berth deck, viz., the Master-at-Arms, Yeoman, Painter. All berth-deck cooks were attacked. After arriving in San Francisco, August 3rd, 1867, nine more cases appeared, the last ones, (three on one day) August 22nd. Ship left San Francisco for Sitka, August 20th. November 21st the crew was transferred to U.S.S. Jamestown, to allow ship to be frozen out. The Resaca left Sitka January 18, 1868 for San Francisco where she arrived January 28. She sailed south later on, cruising off west coast of Mexico, returning again to San Francisco in July without having had a recurrence of the disease.

The following conclusions seem justified:—

The disease germ was carried on board, directly or indirectly June 24th, 1867, with the provisions from the storehouse. The first case of the disease occurred ten days later. Infected mosquitoes must have reached the ship on June 24. The epidemic continued after leaving Panama, 59 cases appearing after that occurrence. Freezing out the ship proved sufficient to prevent recurrence of the disease later.

YELLOW FEVER ON THE U.S.S. SARATOGA, 1869, (*P. A. Surgeon Lewis Stephen Pilcher, U.S.N.*)—While at Havana and while at sea under way to N. Y., and also after arriving at N. Y.

The ship is described as roomy and comfortable, well ventilated and lighted, and a model of neatness and cleanliness throughout. She arrived at Havana May 10, 1869, with a complement of 224 men, and anchored on the west side of the harbor within a stone's throw of the quay lining the shore and in close proximity to the track of a line of ferry boats. For six weeks prior to the appearance of the first case of yellow fever there had not been a single case of sickness, even of the most trivial character.

Yellow fever broke out June 2nd, 22 days after her arrival in port. Two cases appeared on that day, both officers who had probably been infected on shore. These were followed on the next day by one in an enlisted man. June 7th, two more cases developed, as a consequence of which the ship left immediately for New York. While at sea, 13 days, 22 new cases developed, viz.; 1 on the 6th day after leaving, 2 on the 7th day, 6 on the 8th, 1 on the 9th, 4 cases on the 10th day.

Immediately on the ship's arrival at New York, June 20th, the sick were transferred to the hospital ship "Illinois."

June 21st, 7 new cases developed. These were also promptly removed from the ship.

June 23rd, the officers and crew were transferred to the U.S. S. Frolic. While there 2 more cases developed, one June 24th, and 28th each. These were also transferred to the "Illinois." Total number of cases, 37, number of deaths 17.

I regret that the report does not state whether the crew were given shore liberty or not.\* I have been unable to clear up this point from either the Medical Journal, the ship's log, or from the recollection of some of the officers attached to her at the time. The course of the epidemic speaks for secondary cases, although the positive statement about the health on the ship prior to the first cases on board might well raise a doubt as to this point. On the other hand, having anchored so close to the quay, the possibility of the ship having been reached by infected mosquitoes through flight must be considered as within the range of possibility.

This experience proves: 1. That an epidemic of yellow fever can be stopped in mid-summer, by transferring everybody from an infected vessel to an uninfected vessel.

2. That the sick transferred to an uninfected hospital do not necessarily produce new foci or infect non-immune attendants. None of the quarantine officials or attendants on board the "Illinois" were attacked by the disease.

3. The last case that developed among the crew after transfer occurred on the 5th day.

The ship was disinfected by chlorine gas. This was repeated several times during the summer.

Dr. Pilcher closes his report with the following statement: "In the circumstances attending the cases of yellow fever on this vessel, there was none which indicated that the disease was in any way propagated by contact with the sick or by exposure to the emanations or secretions from their bodies. On the contrary those who were most about the persons of the sick escaped entirely. The apothecary and four nurses, all unacclimated and unprotected by previous attack of the disease, who were with the sick continuously night and day, and unavoidably received upon their persons matters vomited by the dying, were none of them attacked."

YELLOW FEVER ON THE U.S.S. MONONGAHELA, 1874, (*Surgeon Hoehling, U.S.N.*)—The experience of this ship shows, and it is recorded on that account, that yellow fever, though intro-

\*Since writing the above Lt. Wieber states he has ascertained that no shore leave was granted.

duced on board is not always followed by secondary cases.

During the stay of this ship at Rio, liberty to the crew was not stopped.

There occurred a case on January 14th, followed by death on the 18th; one case on March 25th resulting in death on the 28th, and a case on March 26th, ending in recovery. All these cases, it is true, were sent ashore to hospital. No other cases followed.

A second outbreak of yellow fever occurred on the same ship in 1875. She arrived at Rio, April 19th, from Bahia. April 22nd the Admiral's secretary, who had been in the harbor of Rio since April 10th, and had just joined the ship (April 21st), from the U.S.S. Lancaster, was taken sick with yellow fever on board and died on board April 28th. He had black vomit, jaundice, albuminuria.

Case 2 was a medical officer, who was taken sick April 27th.

Case 3 an enlisted man taken sick April 29.

Two cases May 1st. Five new cases, enlisted men, May 2nd. All these cases were sent on shore to a private hospital. The ship left for sea that day and proceeded south.

May 5th the surgeon, May 6th, the ship's writer were taken sick.

A temperature of 64° F. was soon encountered and no more cases developed after the fourth day out. Twelve cases.

Removal or isolation of those affected, use of disinfectants, whitewashing and painting, destruction of infected articles were the means resorted to to stop the infection.

The infection in the case of this ship cannot with any degree of positiveness be ascribed to the first case. Liberty was not stopped here. The duration of the epidemic speaks for shore infection. Ship did not leave harbor until May 2nd, the last cases occurred within four days of this time.

YELLOW FEVER ON THE U.S.S. LANCASTER, 1875, (*Acting P. A. Surgeon F. V. Greene, U.S.N.*)—The records of the U.S.F.S. Lancaster show delayed outbreak of the disease beyond five days after leaving port.

She arrived at Rio April 10, 1875, from Montevideo, where she had been three months, and left Rio for the north on the



morning of April 22nd,. On April 21st, the Admiral transferred his flag to the U.S.S. *Monongahela*, taking his personal staff with him. On this vessel the Admiral's secretary was attacked with yellow fever on the following day. The first case taken sick on the "*Lancaster*" was the fleet surgeon. He had been on shore for the last time April 21st. The disease set in on the evening of April 27th, more than six days later. The next morning, 7 days out, two officers were taken sick. One had been ashore on the 13th, the other on the 16th of April, or 14 days and 11 days respectively before the first manifestations of the disease, 17 days after arrival in port or 12 days after the earliest possible infection from an unnoticed light primary case on board. On the 3rd of May, Assistant Surgeon Fassig was taken (12 days after leaving). He had been mess caterer and went ashore frequently. In consequence of this new case the ship changed her course to the southward and headed for Bahia, where she arrived on the 9th of May. Two officers had died in the meanwhile and had been buried at sea. The two remaining sick officers were transferred on shore, where one died on the day following the transfer.

During this experience with yellow fever, the disease was entirely confined to officers, i.e., to the after part of the ship. In the report of the cases the writer states, that a marked feature in all the fatal cases was the albuminous condition of the urine. In each the reactions with heat and nitric acid indicated the presence of albumen from the 3rd or 4th day, with a daily increase in the amount. Irritability of the stomach, in Dr. Fassig's case, was relieved by creosote and bi-carbonate of soda. Dr. Fassig had expectoration of dark colored mucus with slight hemorrhage from mouth before leaving ship; in his case stools became dark-colored and ultimately assumed a tarry consistence.

The Admiral's secretary could not have been the cause of the infection in these cases, according to our present views, as the disease had not broken out in him while on this ship. The cases must have been primary cases. According to the mosquito theory they can only be explained by assuming that mosquitoes infected somewhere else reached the ship and at a convenient time inoculated the above cases. Accepting this explanation, it

is remarkable, that the disease remained restricted to these few cases. The outbreak of the disease in all these cases was very much delayed after leaving port.

YELLOW FEVER ON THE U.S.S. MARION, 1879, (*Surgeon H. J. Babin, U.S.N.*)—The ship arrived at Rio from New York on the 1st of February, 1879, remained in the harbor until the 6th. While here no liberty was granted the crew. Officers were allowed to go ashore on one day, after that only on duty. The ship took in coal and paymaster's stores which were brought alongside in lighters. The coal was stowed away by native workmen, provisions and wood were removed from lighters and stowed in the holds by the crew. The stores were taken from the Government store-house, which was some distance from the city on an island.

Four days after leaving port, February 10th, the 9th day after arrival, the first case of yellow fever appeared, in the person of an enlisted man. On February 11th a second case appeared, a third case on the 15th, by February 21st there were 11 cases on the sick list. Altogether there were 25 cases on board, 19 enlisted men and 6 officers, of whom 3 died. The symptoms were characteristic.

The ship went to Montevideo and entered quarantine at Flores Island February 19th. All the sick were transferred on shore, some to the hospital some to tents. The crew and officers except ship keepers and commanding officer were sent on shore next. New cases occurred until March 3rd, (12 days after removal of sick.) Fumigation and cleaning commenced February 26th. This continued until March 13th, chlorine gas being used. Bilges were flushed, pumped dry, and disinfected with copperas. March 13-15 windsails set and holds ventilated. March 15, two new cases, which were followed by a second disinfection. March 17th fumigated with  $\text{SO}_2$  (45lbs. S. burned). March 18-20 the holds and bilges were scraped, cleaned and whitewashed; the paint work was washed with carbolic acid.

March 20th the ship was again fumigated, 80lbs. of sulphur were used this time. During the next two weeks the sick bay and berth deck received two coats of paint. All fuel and stores

taken on in Rio were thrown overboard.

April 6th and 7th the officers and men went back to the ship. No more cases occurred.

*Conclusions.* As none of the crew had been on shore and their only intercourse with it had been through the stores, which had been brought alongside in lighters three to four days after the arrival of the ship in port, the connection between the provisioning and the outbreak of the disease must be conceded. All except the late cases were primary cases.

Officers had been on shore. The first case among them occurred on February 17th.

In consequence of the energetic measures resorted to, especially the removal of the crew from the ship 9 days after the outbreak, a greater epidemic was prevented.

The cases that occurred after removing the crew to the shore were probably due to infection on board ship during work of disinfection.

YELLOW FEVER ON THE U.S.S. PLYMOUTH, 1878 AND 1879.—The ship arrived at St. Thomas, W. I., from Portsmouth, N. H., under order to Santa Cruz on account of an insurrection on that island, Oct. 21, 1878. Here she was coaled by natives. During the season nine or ten deaths from yellow fever among Danish soldiers had occurred. No liberty was granted, very few stores were taken aboard. Oct. 25th the ship left for Santa Cruz where she remained at anchor half a mile from shore until Nov. 7th. On shore there had been one death from yellow fever about three weeks before ship's arrival. No liberty was given to the crew, nobody allowed ashore after sundown. Nov. 5th the battalion from the ship was landed for a drill. There had been no case of fever of any kind on the ship since Oct. 6th. Nov. 4th an enlisted man was taken sick with yellow fever. During the night of Nov. 5th two midshipmen, Nov. 6th a fourth man, were stricken with the same disease. Nov. 7th all the sick were transferred on shore and the ship left for the North. On this day three more cases developed. Total number of cases seven, of whom three men died. The ship was fumigated with sulphur on Nov. 8th and again Nov. 10th. The bilges were disinfected

with sulphate of iron and chloride of lime. Nov. 30th the ship arrived at Portsmouth, N. H., where the birth-deck was again fumigated.

Dec. 17th the ship arrived at the Boston Navy Yard. Here she was broken out, all stores, provisions, and clothing were taken out. The crew was transferred to the Receiving Ship and the vessel fully exposed to the cold in the dry-dock, from Jan. 20th-Feb. 4th. Average temperature, during this time, on deck 28°. At the bottom of the dock, which was piled up with ice, the temperature was 10° colder. Jan. 26th she was fumigated with 60 lbs. of sulphur below decks, temperature 0°, the water was frozen in buckets in every part of the ship. Feb. 2nd she was fumigated again as before, temp. 11°F. Fumigation extended over 2 days, with the ship closed.

Ship came out of dry dock and was witewashed. She had been overrun with ants and cockroaches before, not one has been seen since that winter. To repeat; the ship had been fumigated 5 times. All visible insects had been killed. The temperature on ship had at least once been reduced to zero.

The ship was recommissioned, and on March 15th sailed South. On the p. m. of the 21st, after the ship had been battered down during a violent gale, a man was taken sick with what was diagnosed as Yellow Fever. He had high fever, about 104° for 3 days. On the fourth day the temperature fell to 102° and remained there that entire day. Profuse sweating set in, pulse fell. The next day the temperature again rose and reached 104.6°. From the 27th he improved slowly but steadily. Urine was albuminous, skin and conjunctivae were yellow during convalescence and continued so for a week, pulse had been irregular, stomach irritable, was convalescent on the 7th day.

On March 22d, a second case occurred presenting the same symptoms. There was great irritability of the stomach, remission on the 4th day. The man died on the 10th day in typhoid condition. The ship turned back on recommendation of her medical officer, on the 23d or 24th of March, and put into Bermuda for coal. On the 25th temperature had fallen to 63°. She returned to Portsmouth. Sanitary survey held 10 months later.

Extensive decay in woodwork found throughout the ship.

Officers who were on the ship during this cruise have stated to me, that the woodwork on the birth deck could not be properly scraped and repainted on account of its rotten and honey-combed condition.

The first epidemic, which seems to have been an unquestionable one, was probably stopped by the prompt transfer ashore of all the sick. It was the cool season of the year, the ship was on her way North. She soon struck cold weather, and this may have stopped the development of further cases.

The infecting agent may have been brought aboard during the coaling at St. Thomas between Oct. 21st and Oct. 25th, or else in some way while at Santa Cruz after Oct. 25th.

Referring to the second epidemic, I have to repeat that there were only two cases of sickness, and that the correctness of the diagnosis principally on that account has been doubted; however, these cases were seen by the same surgeons, who had been on board the ship during the first outbreak, and appeared to them of the same character as the previous cases.

For the sake of medical science it is to be regretted that the disease was not allowed to prove beyond doubt its real nature.

Dr. Sternberg writes about the effect of season on the spread of yellow fever: "There are numerous facts which indicate that the infecting agent is not destroyed by a freezing temperature, although rendered inactive. Epidemics which have been checked by frost, have been revived by the recurrence of warmer weather and in certain instances in temperate regions the germ has survived the winter and a second epidemic has occurred without a new importation."

The interval between the cases was from November 7th, 1879 to March 21st, 1880,  $4\frac{1}{2}$  months.

How the morbid agent escaped the various fumigations I will not attempt to explain.

YELLOW FEVER ON THE U.S.S. NEWARK, 1894—The following facts are taken from the official report of the Commanding Officer. "Bumboats were not allowed. Communication with the shore after January, 1894, was restricted to the most urgent necessities. Shore leave was not given. After February

1st, supplies were received by means of a tug boat from shore, the messes getting supplies by ordering."

The paymaster's yeoman of the ship was the only member of the crew allowed to go ashore in this tug at 6 a. m., for the purpose of attending to the supplies for the fleet, and was under orders to return about 9 a. m. He was taken sick with yellow fever February 13th, and transferred to a hospital on shore the same day, where the diagnosis was confirmed. For a week prior to February 12th he had stayed ashore continuously. The ship left for Flores Island, in the Platte River, the same day (Feb. 13th). The man recovered.

Other cases followed, one on February 17th. This case was sent ashore to Flores Island quarantine hospital Feb. 19th and recovered.

Another case on Feb. 20th. The man was sent to the same hospital Feb. 24th, where he died after having had black vomit. A fourth case occurred on Feb. 25th. This case was sent to the hospital on the same day and recovered.

Two of these cases had swung their hammocks over the hatch leading to the compartment in which the pay yeoman was taken sick. This had been fumigated immediately after the removal of the first case.

In answering my questions about the cases, Surgeon Pick-erell, U.S. Navy, writes: There has never been a doubt in my mind as to the correctness of the diagnosis. I had seen yellow fever in Hayti prior to this and everything seemed to point in the direction of that disease. The eyes were slightly yellow with the blood vessels injected and standing out very distinctly, also the bilious vomit, which came without effort apparently and was propulsive in character. I remember in some of the cases the effort to speak brought on vomiting and as there was no warning when the patient turned in your direction to answer a question, the vomited matter was liable to come all over one. As a matter of fact this happened more than once.

This ship was not near the shore nor near any other ship. The infecting agent must have been brought aboard by the yeoman in some of the stores purchased, and brought on board by him on his last return before being taken sick.

NOTES ON THE TREATMENT OF YELLOW FEVER AT  
LAS ANIMAS HOSPITAL, THE HOSPITAL OF THE  
SANITARY DEPARTMENT, DURING THE EPI-  
DEMIC OF 1900 AT HAVANA, CUBA.

BY COLONEL WILLIAM CRAWFORD GORGAS.

ASSISTANT SURGEON GENERAL IN THE UNITED STATES ARMY.

I N 1882, early in my professional career, I passed through an epidemic of yellow fever at Fort Brown, Texas. I was medical officer in charge of the sick at this post, and contracted the disease myself. Since then my attention has, naturally, been much devoted to the subject. Again, in 1897, I was medical officer at Fort Barrancas, Fla., when the troops suffered from yellow fever there. In 1898, I had charge of the yellow fever hospital established at Siboney, the place where our army landed in Cuba, from its establishment till its close. Since December 1898, I have been in Havana, continually and daily in contact with this disease.\* From my extended observations, I concur in the general opinion that the treatment of the yellow fever affects the mortality to a very great extent—more so than in any other disease with which I am acquainted—and from my official position as Chief Sanitary Officer of Havana, as member of the Yellow Fever Commission (which examines all reported cases in Havana,) and as visiting physician to Las Animas Hospital (the yellow-fever hospital there) I have had unusual opportunities for collecting accurate statistics, and think these statistics will demonstrate this fact to a very marked extent. I was appointed visiting physician to Las Animas Hospital in April, 1900, by the Mayor of the City, and since that time, in conjunction with Dr. John Guitéras, have had entire control of the treatment and care of the yellow fever patients in that institution. I go

---

\*These notes were prepared in January, 1901, but have never been published.

through this, somewhat detailed personal history, to indicate that I have had ample facilities for observing the disease, and for controlling the treatment in a large number of cases.

Yellow fever in Havana, is treated almost entirely in the hospitals. Of the 1,244 cases occurring during the year 1900, only 141 cases were treated at private houses in the city; all the others having been assisted in the various hospitals. 1051 cases were treated in the four following hospitals: Las Animas, Dependientes, Covadonga, and Benéfica; Las Animas received 272 cases with 58 deaths, a death rate of 21.32 per hundred. Dependientes 349 cases with 85 deaths, a death rate of 24.35 per hundred. Covadonga 196 with 54 deaths, a death rate of 27.51 per hundred. Benéfica 234 cases with 57 deaths, a death rate of 24.35 per hundred. Las Animas had considerably the smallest death rate, although the other hospitals had a vast advantage over Las Animas in the class of patients received. Las Animas received all the poor from the municipality suffering from yellow fever, cases picked up from the police stations, and all cases not otherwise provided for. The three other hospitals are private hospitals belonging to Spanish clubs. Their members pay a fixed sum monthly and, when sick, are thereby entitled to care in the hospitals of their society. Nearly all Spaniards, who can afford it, matriculate in one of these three societies and, whenever sick, go there for treatment, consequently, their yellow fever patients go into the hospital on the first or second day of the disease. This is an all-important item in the treatment of yellow fever. Whatever measures are to be taken, are most essential in the first three days of the disease. To make a fair comparison, the deaths occurring within the first three days after admission to these hospitals should be eliminated, because the patient who dies within the first three days after admission to the hospital, was, when admitted, too far gone in his disease for treatment to have any marked effect. Eliminating this class of patients from the four hospitals, we find that Las Animas had 18 who died within the first three days, Covadonga 4, Benéfica 2, Dependientes 8. This would change the total, giving Las Animas 254 cases with 40 deaths, Dependientes 341 cases with 77 deaths,



Covadonga 192 cases with 50 deaths, and Benéfica 232 cases with 55 deaths, which would change the death rate as follows: Las Animas 15.75 per hundred; Dependientes 22.57 per hundred; Covadonga 26.04 per hundred and Benéfica 23.70 per hundred. This eliminates from all the hospitals the moribund cases and those too sick to profit by treatment. It at the same time shows how many more of this class of cases Las Animas received than did any of the other hospitals, and is a fair illustration of the greater severity of the average cases received at Las Animas than of those received at the other hospitals. This is easily accounted for, as I have already pointed out; the Spanish hospitals receive the better class of clerks and laborers who are able to keep up their dues. Las Animas receives municipal patients who are too poor or too improvident to pay these fees. The other hospitals get their patients in the first day or two, as soon as they are unable to work. They consider that they pay, and have a right to the care, and go there whenever they feel sick from any cause. They go to Las Animas when they are sick enough to apply for aid to the various public institutions or are picked up on the streets by the police. So, I think it fair to say that the comparison in the gravity of the cases received and treated by them is still considerably in favor of the Spanish hospitals as compared with those received and treated at Las Animas, even after making deductions as above.

The most favorable class for comparison at Las Animas, of patients received there, is the class of Americans. While we receive destitute Americans—the tramps and disreputable from the police stations—we also receive a large number from the better class. It is generally known among the Americans that we have trained nurses, English-speaking doctors, and that the management of the hospital is after the plan of those in the United States. Most of the Americans were in boarding houses, not with their families, and for this reason it was difficult for them to have themselves taken care of when sick. For these several reasons, a large number of this class came early to the hospital. Though even this comparison is still against Las Animas, as we

have to include the tramp element and the element from the police stations. During the year we had treated at Las Animas for yellow fever, 167 Americans with 21 deaths, giving a percentage of 12.57 of deaths. Of these 21 deaths, 5 occurred within the first three days. Deducting these, it gives 162 cases with 16 deaths, a death rate of 9.87. Even this, I think, could be reduced if we could get our cases within the first two or three days. In making comparisons we see as follows: Taking 100 Americans of the class specified, we lost 9.87 per cent; taking 100 yellow fever cases from the records at large, 24.91 per cent died; taking 100 Spanish patients at Dependientes, which were certainly not more severe than the Americans received at Las Animas, we get a death rate of 22.57, leaving a saving of 12.70 lives per hundred in favor of Las Animas. In comparing the Americans treated at Las Animas and the Americans treated at their homes in the city, we still find the same difference in favor of Las Animas, though the class of cases of Americans sent to Las Animas was more severe than the class retained at home. Those who were treated at home were sufficiently well-to-do to provide nurses, pay physicians and take care of themselves generally. During the year there were 42 Americans with 9 deaths treated for yellow fever at their homes in the city, giving a death rate of 21.42 which leaves 11.55 lives in favor of Las Animas.

I think it fair to assume that the above results are due to the difference in treatment at Las Animas, and in the institutions and places with which comparison is made, Las Animas was especially equipped for this service. The buildings were arranged so that the patients as they came in were placed in a reception ward. As they were diagnosed they were distributed in two other wards which were used exclusively for yellow fever. We averaged through the summer, about 35 yellow fever patients constantly under treatment. These wards were divided up into rooms of two or three beds, a very convenient arrangement for our purposes. We had an excellent corps of American female trained nurses, mostly graduates of training schools, and a number of male nurses.

Dr. John Guit  ras and myself, alternated month by month, as visiting physicians of the Hospital. We had in the Hospital a resident physician and an assistant. The greatest care was ex-

exercised in the supervision of the patient, to see that he should make absolutely no physical exertion from the time he came under our control till convalescent or dead. We had ambulances attached to the Hospital and when a call came in, the ambulance responded accompanied by a medical officer and a litter squad. The instructions were mandatory that the patient should be transferred from the bed to the ambulance in a litter, and where a litter could not be used, in an arm chair. He was placed in the ambulance, and the ambulance driven in a walk to the Hospital. He was taken out in the same way, placed in a bed, given a cleansing bath, and required to keep in the recumbent position during his sickness.

We had a corps of nurses sufficient to have one present all the time with the patient, so that everything could be attended to without exertion on the patient's part. The use of bed-pans and urinals was strictly enforced. The diet of the patient was carefully regulated daily by the visiting physician. Our custom was, during the active stage of the disease, to make the diet absolute, that is, no food whatever. As the temperature subsided, and other symptoms did not contraindicate, we began the cautious administration of milk, and gradually extended the diet as the patient could bear it. We varied this course in the severer cases, not letting the patient go more than four or five days without food of some sort. In cases where conditions of the stomach contraindicated giving the diet by the mouth, either on account of hemorrhage or excessive irritability, we gave it by the rectum. In general, as far as my observations have extended in Havana, yellow fever patients are kept much longer than this without food—to their detriment, I think. I feel confident that I have seen patients die from debility, after the acute symptoms of the disease had subsided, who could have been saved had cautious feeding been commenced earlier. Patients were encouraged to take water freely in any way that suited their fancy. Cracked ice was always kept at the bed-side and given *ad libitum*. The various carbonated waters, ginger ale, distilled water, and water from the general city supply, were furnished the patient as he preferred. An accurate record was kept of the quantity of urine passed. A cathartic was given generally on admission and through the course of the disease as indicated. I gave five

grains of phenacetin or some similar analgesic at any period of the disease at which the patient complained much of headache or muscular pains—this was usually within the first three days. But the general practice was to put as little into the stomach as possible, and most of the patients came through their disease without anything of the kind. Irritability of the stomach was treated by external applications, mustard plasters, etc.—with cracked ice internally. I have stopped giving any medications whatever.

Generally, when the quantity of urine fell below 500 C.C. in 24 hours, or when there was suppression, I used saline enemata and local applications to the back. For suppression I have stopped using any drug. My experience has taught me that a desperate case stands better chances of pulling through if the patient is carefully nursed, supplied freely with water and nothing put in the circulation that could possibly irritate the kidneys. Suppression of urine is not so common a cause of death as I formerly believed, and generally, if the catheter is used, the patient will be found to be secreting more than 500 C.C. in twenty-four hours. The convulsions, which are the immediate cause of death in a large majority of cases, do not seem to me to be uraemic, but rather the direct effect of the yellow fever poison upon the nervous system. I had, however, a few cases, in which the uraemic symptoms were all out of proportion and in which the patient had complete suppression of urine for 48 hours or longer, before death. The yellow fever poison seems to exert in all cases a selective action upon the kidneys. It is the most marked symptom of yellow fever as compared with other fevers. High temperature is not a troublesome symptom in yellow fever. Generally, when the temperature remains above 103° for any length of time, I have the patient sponged every two hours with cold water. For gastric hemorrhage, so common a symptom in this disease, I have ceased to use the various astringents. I have become convinced that this symptom is best treated by rest to the stomach, with enough cracked ice to keep the patient from suffering.

In private practice, it requires a great deal of tact to retain the confidence of the patient and carry out this routine. Both the patient and his friends are anxious and uneasy unless he is constantly receiving something in the way of drugs for this disease, for which there are so many specifics in this community.

In the hospital, it is easy. In the first place, the reputation of Las Animas among the Americans, is very well established, and then the patient sees all around him other patients who have gone through the same course and are recovering. To carry out our routine at Las Animas, requires a larger nursing force and unremitting care, which none but the wealthy are able to afford at their homes.

In Havana it is the custom to use drugs very extensively in this, and most other diseases. Some time ago, I was looking over a clinical history of a yellow fever case at one of the hospitals. In one column was recorded the medication. During the preceding twelve hours some doses of medicine had been given to the patient every half hour—within the preceding twenty-four hours he had taken 24 three-grain doses of phenacetine. At the foot of the column, the nurse had recorded "dosing all the time." While this was evidently true from the record before me, I was surprised at the nurse's commenting on the fact, and asked what it meant. I was informed that the patient had been sleeping and the nurse meant to say that he was "dozing all the time." Both notes were evidently accurate in this case, but the first much the more important, as far as the welfare of the patient was concerned.

To sum up: I think our methods have saved 12 lives per hundred more than the most successful of the Spanish hospitals; 15 lives per hundred more than the general average of the city, and  $11\frac{1}{2}$  lives per hundred more than among the Americans treated in the city.

While the death rate of 9.87 can probably be lowered in some of the milder epidemics in the United States, it must be remembered that this result was obtained in Havana where the type of the disease is most virulent, and that the cases considered in this class were probably more severe than the average. I make this note with the hope of impressing upon the hospital authorities the desirability of giving greater routine care to the patients, and of employing a greater number and a more skilled class of nurses. While it would probably considerably increase their expenses to follow our Las Animas routine the outlay would be amply repaid in the number of lives saved, as evidenced by these statistics.

## THE ETIOLOGY OF YELLOW FEVER.

By HERMAN B. PARKER, M. D.,

PASSED ASSISTANT SURGEON IN THE UNITED STATES PUBLIC  
HEALTH AND MARINE HOSPITAL SERVICE.

THIS subject has been an attractive field for investigation for many years. There were two incentives for conducting investigations as to the origin and cause of the disease: first the benefit of humanity generally; second, the maintaining of commercial intercourse with the well known centres of infection with a minimum danger of introducing the disease into new habitats. Investigators in the United States have been particularly influenced by periodic losses of thousands of lives and almost complete commercial disaster caused by rigid quarantines between infected and non-infected centres. From time to time, even with the precautions employed, infection crept in resulting in great losses to life and commerce that sometimes extended over several years. The great epidemic of 1871, that swept up the Mississippi valley, and the smaller epidemics in Georgia, Florida, Alabama, Mississippi, Louisiana and Texas are worthy examples of the death losses, while the commercial losses of such an invasion are equaled only during times of war.

In the earlier epidemics, particular attention was given to the miasmatic origin of the disease. The earlier investigators dealt with an unknown quantity that resisted all measures but cold: that is, with the advent of frost the disease disappeared sometimes permanently, at other times to recrudescence on the recurrence of warm weather. It was also noted that if the disease was introduced early in the spring, great virulence was attained before the subsidence of the epidemic, while if introduced late in the summer, the epidemic was correspondingly mild. This corresponds to the virulence attained by vegetable pathogenes by frequent passage through animals and is well illustrated not only

in yellow fever but in malarial fever as well, the tertian parasite being the example.

The first serious investigation of the etiology of this disease was conducted by Sternberg in Havana in 1889, the results of which were made public in his monograph of 1890. While Sternberg's findings have always been the subject of considerable speculation, they embody to-day our complete knowledge of the relation of vegetable organisms to the disease; that is, that no vegetable organism is encountered in the fluids and tissues of the yellow fever subject in a sufficient percentage of cases to give that organism prominence as an etiological factor. Sanarelli, the Italian bacteriologist, in 1897 disputed the findings of Sternberg because of having encountered in the yellow fever cadaver an organism that gave specific media reactions and which he isolated in about fifty per cent of the cases studied. This organism, the *Bacillus icteroides*, according to Sanarelli and others also produced lesions similar to yellow fever not only in the human subject but in animals as well. Sternberg, however, objected and it is this objection that stimulated further investigations on the subject. My own experience with this organism is that in young, otherwise healthy subjects, during the course of the disease, and at autopsy immediately after death, the fluids and organs are free from vegetable organisms. This is the experience of other recent investigators.

Nott of Mobile, in 1848, as far as I am aware, was the first writer to advance the theory of the transmission of yellow fever by the mosquito. There were many similar papers presented subsequent to this time. In 1881 Dr. Carlos Finlay of Havana, read a paper before the Royal Academy of Sciences of Havana, on the transmission of yellow fever by the mosquito, and, while his report was not taken seriously for many years, it is a noteworthy fact that at that time and in his subsequent work he used the same species of mosquito that was afterward proven to be the real disseminating agent of the disease.

In 1898, the late Major Walter Reed, U.S.A. and Dr. James Carroll, U.S.A. began a series of investigations on the hypothesis of Finlay, Nott and others. The successful results of these in-

vestigations while interesting to recite are too familiar to be reviewed. I can say however that three facts were proven absolutely: first, that the blood of the patient sick with yellow fever harbors the infection; second, that a mosquito that has fed on a case of yellow fever can, after a certain number of days, transmit the disease to a non-immune individual; third, that the indications for the suppression of yellow fever are to protect the patient from attacks and to destroy the breeding places of these insects. It was this latter finding that paved the way for eradication of yellow fever in Cuba by Colonel Gorgas, and that needs but a conscientious application to place this disease in the classification of historical diseases.

On the successful termination of Reed and Carroll's work, efforts were made in almost every quarter where yellow fever prevails to detect in the blood of the patient and in the tissues of the mosquito, some organism belonging to the group of protozoa that would present analogies with a similar insect-conveyed disease, i e., malaria. These efforts were uniformly unsuccessful both in the human subject and in the mosquito, so that the inference was drawn that the cause of the disease belonged to the ultra-microscopic groupe of organisms (Sternberg), and that with our present appliances it could not be detected.

In order to stimulate interest in future investigations, and to advance our knowledge of this disease, so that a scientific quarantine could be established for the protection of the health of our country without impeding but rather facilitating our commerce, it was suggested by Surgeon General Wyman, that there be formed within the Public Health and Marine Hospital Service a Yellow Fever Institute, with the object to collect all facts concerning yellow fever, to designate specific lines of investigation and to make them. This institute is divided into four sections, including History and Statistics, Etiology, Transmission and Quarantine. The Institute met with hearty approval and now has enrolled among its members the leading scientific men of the world. Already thirteen bulletins have been issued, one of the most important of which was contributed by Surgeon H. R. Carter, P.H.&M.H.S., relating to what is known as the extrinsic



period of incubation of the disease, that is, the period of time that elapses between the first case and subsequent cases of yellow fever, which is due as we now know to the time required for the mosquito cycle of the disease. These well deduced facts, noted before the conclusions of the Army Commission were reached, served to strengthen them and to hasten within our service the acceptance of the radical changes in relation to our quarantine laws that the conclusions of the Commission demanded.

As an outgrowth of the Yellow Fever Institute there was formed a Working Party, consisting of Professor Beyer and Dr. Pothier, with myself as Chairman, with orders to proceed to Vera Cruz, Mexico, and study the etiology of the disease. This party remained in Vera Cruz about five months. The members prepared a report which was completed in February of this year and has been issued by the Surgeon General as Bulletin No. 13.

The attention of the Working Party was first directed to the study of the pathological changes in the tissues and especially in the blood. After a number of blood counts which showed a gradual increase per cubic millimetre in the number of red blood cells during the course of the disease, it became evident that what we were seeking could not belong to the *haemosporidiæ*. The tissue changes at autopsy though pronounced in nearly all the organs, especially the epithelial, presented no clue that could be followed with promise of success.

While the above mentioned studies were in progress, a series of mosquitoes were contaminated by feeding on cases of the disease and at intervals were imbedded, sectioned, stained and examined. Early in this work we encountered certain alterations in the mosquito which from similarity with mosquitoes contaminated with malarial infection gave promise of giving us a specific organism, which, while not presented as the cause of yellow fever, seems to bear so close a relation to it, that further confirmation only is lacking to establish that specific fact. Owing to the striking analogy to the sporogenic phase of the malaria, the difficulties encountered in working out and presenting the various phases of the organism were minor compared with the original work on malaria by Manson, Ross, Koch, Grassi and others, so

that after five months work the details of this organism are presented with fair accuracy.

In the examination of fresh blood no organism, even with modern stains and technique, could be demonstrated. This is not surprising or mystifying, as under certain conditions a common large organism, the *Trypanosoma lewisi*, can be made to apparently disappear from rat's blood and yet that blood when introduced into another rat readily transmits the disease. Similarly, were malaria due to an extra-corpuscular parasite or if it passed its schizogonic cycle in a tissue other than in the blood, the blood serum taking up all the merozoites immediately after sporulation, how difficult would be our diagnosis even when we knew that the serum under consideration must contain myriads of these bodies. In fresh or unstained preparations it would be impossible to make a clinical diagnosis while with the most modern staining reagents it would require an experience beyond that of the average expert to establish a positive diagnosis.

While the schizogonic cycle of the organism of yellow fever is largely a matter of speculation. Sternberg has advanced, and Finlay and others have accepted, the theory of an ultra-microscopic cycle of this cycle of the organism. Such a theory does not appeal to me as being tenable. Sporulation of protozoa is not necessarily confined to the blood elements and the rapid and in some instances almost complete destruction of the epithelial cells, especially of parts of the alimentary canal, suggests that schizogony might take place in those structures. The self-limitation of the disease suggests also an auto-agglutination of these organisms in some tissue of the body.

After a mosquito has been permitted to feed upon a case of yellow fever and the blood has been digested, usually in three days, the first phase of the organism described in our report is observed. This consists of a nucleated, fusiform shaped organism, 3 to 4  $\mu$  long and 1  $\frac{1}{2}$  to 2  $\mu$  broad (Figure 1). They are noted first in the stomach, and then to have passed through the stomach wall into the esophageal diverticulum. There, these organisms gain access to the albumenoid mass, stored in that structure as a result of the blood diet, increase in size, and become

globular. The nucleus then undergoes fragmentation or multiple division (Fig. 2). The resulting chromatophilic granules in-



**Fig. 1. Fusiform Shape Protozoa, the Myxococcidium Stegomyiae, in Stomach and Esophageal Diverticulum.**  
(Bulletin 13, Yellow Fever Institute, P.H.&M.H.S.)



**Fig. 2. Fragmentation or Multiple Division of the (Zygote?) after gaining Entrance to the Albuminoid Mass.**  
(Bulletin 13, Yellow Fever Institute, P.H.&M.H.S.)

creasing in size, become more sharply defined and more or less elongate oval, the spores.

The spores retain their regular arrangement in the oöcyst (Fig. 3), until the albuminous mass has been called upon for the nourishment of the insect, when, by liquefaction, the spores are liberated in the diverticulum. They then commence to migrate toward the direction of least resistance, that is toward the thorax; arriving at the anterior part of the diverticulum they



**Fig. 3. The Oöcysts in the Albuminous Mass in the Esophageal Diverticulum**

*The epithelial structure above is the mid-gut.*

are, with the exception of that thin structure and a loose, reticular tissue surrounding and supporting the salivary glands, in contact with the glands. Like the sporozoites of malaria they pierce these structures, pass between the cells of the gland (Fig. 4), and gain access to the lumen where they would naturally be discharged when the insect procures food.

I have been trying to convince myself that the salivary glands play an important though minor role in the transmission of these organisms as well as in malaria. The function of the esophageal

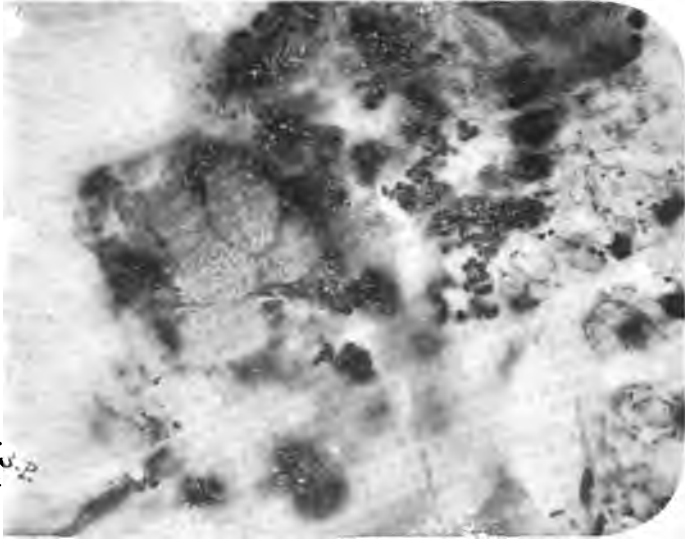
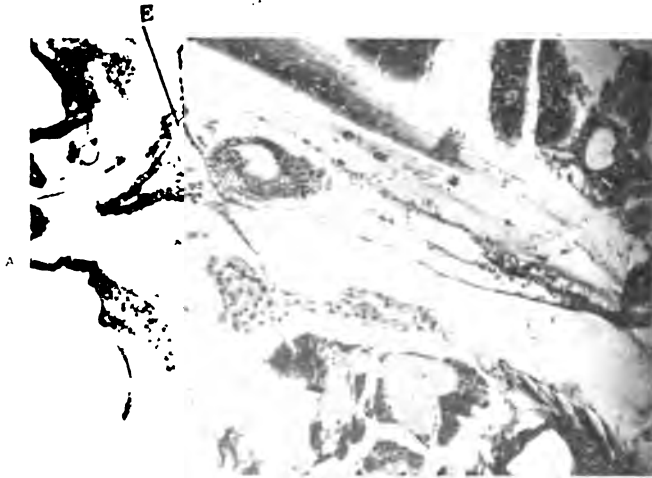


Fig. 4. Spores leaving the Esophageal Diverticulum and Invading the Salivary Gland.  
*The intervening tissue contains many spores*



Fig. 5. Median Plane of Mosquito with Albuminoid Mass in Diverticulum;  
the Stomach Above and Posteriorly.

diverticulum in connection with the transmission of disease is not yet thoroughly understood. My own opinion when Bulletin No. 13, was issued, was, that this organ was a storehouse for food; for example, a mosquito feeds upon blood, the blood is digested, the albuminous constituents pass into the diverticulum (Fig. 5), and are called upon for the nourishment of the insect. This nourishment, I may add, is primarily for the maturation of the ova, for as the albumen diminishes, the ova increases enormously



**Fig. 6. Median Plane of Mosquito.**

*A. Esophagus; B. Homologue of proventriculus; C. Upper and Lower Border of Esophageal Diverticulum; D. Thoracic Ganglion; E. Dorsal, or Accessory Diverticulum. (Bulletin No. 13, Yellow Fever Institute, P.H.&M.H.S.)*

in size, displacing the other organs downward and forward. Nuttall and Shipley, (Journal of Hygiene, April 1903) take this same interpretation of this organ but add: "Assuming that this first meal is of blood containing malarial parasites, then the parasites might be retained, chiefly within the ventral sac and they would have difficulty in getting out of it. The chitinous lining would prevent the exit of the vermicules, and many would die within the sac; a few might of course be pumped out of the sac later and

thus reach the stomach, but by that time they might have died. Of course this is only hypothesis, but it may explain some of the negative results obtained by various investigators who have failed to infect their mosquitoes with parasites."

My own view supported by my own experiences is diametrically opposite to the hypothesis of Nuttall and Shipley. It has been my experience that the albumens are stored in the diverticulum and that all organisms both of yellow fever and malaria that undergo sporogenous development must reach this albuminous mass in order to undergo this development, and that the stomach and stomach wall are eliminated in the future phases of the organisms of these two diseases. The error in the majority of instances I believe to have been due to interpreting this albuminous mass as a part of the stomach wall. An examination of Figures 3 and 5, will show the connection; the stomach wall above, lower side, and the albuminous mass filled with oöcysts occupying the esophageal diverticulum below are well shown. An examination of the plates of the articles of a number of authors show the malarial parasites undergoing development in just such an albuminous mass and with my own experience tends to confirm these observations.

Anatomically speaking, the diverticulum is the proper structure for the development of parasitic protozoa in the mosquito, on account of its isolation from the general life of the insect and because it furnishes an unobstructed channel through the thorax to an intimate relation with the salivary glands (Fig. 6); or as suggested by Nuttall and Shipley, if the diverticulum can expel its contents, it would seem reasonable to suppose, and as I believe, that infection can and does take place by forcing or permitting the escape of its infecting contents through the esophagus, mouth and proboscis in the act of feeding. It seems more reasonable to believe that the majority of infections take place through natural channels, than through penetration of tissues even though loose in structure, from the diverticulum to the salivary glands, a process which does take place, however, as illustrated in Fig. 4.

Interesting physiological and pathological processes are illustrated in the study of the function of the esophageal diverti-

culum. When a mosquito feeds upon a healthy individual, the albuminous elements of the blood pass into the diverticulum during the process of digestion. Under normal conditions the mosquito then goes to rest. The albuminous mass is called upon to furnish food and gradually through liquefaction proceeding from the surface, it is slowly appropriated for the physiological necessities of the insect. Practically all this food is called upon for the ova which rapidly hypertrophy and become mature; the object of procuring the animal food is that this process may take place, which it is agreed by all authorities is a necessity. When the ova are mature, the instincts of the insect are for ovaposition.

When a mosquito feeds upon a case of yellow fever or malaria these functions are of necessity altered. The organisms pass through the stomach wall into the diverticulum, where, rapidly increasing in size during the process of growth, they appropriate practically all the nourishment for their own food; hence the physiological functions are interfered with, the ova may increase slightly in size in the beginning, but rapidly retrograde; in some specimens actually atrophy. It is this latter fact that plays so important a role not only in the two diseases under consideration, but probably in all insect-conveyed diseases, for the biting proclivities of the insect are solely to procure food necessary for the maturation of the ova and consequent multiplication of the species. If now, there is no response from the first meal of blood, the insect feeds on other individuals and after a lapse of a certain number of days transmits the disease acquired from the first individual. I have never seen ova that anywhere approached maturity in a mosquito that was contaminated with the organism described in connection with yellow fever. It is a well known fact that with proper food all ova mature in four to six days and that after ovaposition the insect dies.

As the insect lives under normal conditions until ovaposition occurs, and, as the physiological process of a contaminated mosquito are interfered with to such an extent that the ova do not mature, we find the solution of the long life of contaminated insects, and as these insects try repeatedly to regenerate their ova by securing additional blood, we also find the solution of the rapid spread of an epidemic of the disease.



The mechanics, so to speak, of the above, serve to explain many instances of failure in experimental contaminations of mosquitoes both with yellow fever and malaria. The majority of investigators in my opinion, begin artificial feeding too early and do not choose one of the natural foods of the mosquito in this feeding. Nor instance, a number of mosquitoes are fed on a case of yellow fever or malaria; the mosquitoes should then be set aside for two days when it will be observed that all those mosquitoes that did not feed or did not feed sufficiently to be of value, will have died. Artificial feeding should then be commenced. If a fluid medium, as sugar and water or sweetened serum, be chosen, and for convenience these are usually preferred, I have, from actual observation, seen the fluids pass into the stomach and immediately into the diverticulum, distending that organ like an immense bladder, a fact well worked out in the paper of Nuttall and Shipley. This watery fluid immediately mixes with the albuminous mass and after two or three feedings causes it to disappear, thus destroying the food and encysting mass for the development of the protozoa, some few of which take on an irregular development the phases of which cannot be distinguished for study. Such a mosquito, especially in yellow fever, may be considered infected as it will in some instances transmit the disease.

If instead of a liquid diet these mosquitoes be fed upon a dry diet, as a ripe banana preferably, or other sweet fruits, this flushing of the diverticulum and consequent interference with the albuminous mass does not take place. The mosquito simply extracts enough fluid to sustain life and in so doing extracts sufficient nourishment in the way of vegetable albumins as well. In order that this feeding may be properly controlled, the banana may be sterilized a few minutes that all animal life may be destroyed, or as suggested by Berkley, be completely sterilized, that the intestinal tract be protected from the invasion of vegetable organisms and the consequent destruction of the mosquito. The fact of this destruction, I have observed in but one instance.

The accessory or dorsal reservoirs in *Stegomyia fasciata* are present as in *Anopheles maculipennis* and other species of *Anopheles*, but certainly do not reach the development suggested by

some authors for the latter genus. As nothing has been observed within these sacks their function is consequently unknown.

Another interesting fact noted is the change that takes place in the salivary glands of *Stegomyia fasciata* when contaminated by feeding upon a case of yellow fever. These organs normally lie as distinct tubules, well separated from each other; when however, a mosquito becomes contaminated, these glands undergo considerable hypertrophy and become convoluted. The interpretation and importance of this change, aside from the simple addition of the spores, is not yet understood.

The bionomics of the mosquito is still in its infancy. In the United States, this important work, except in government laboratories, has not excited the interest that comparatively unimportant features in bacteriology excite. It is with regret that I must say that the English, Germans, and Italians are not only the pioneers in this most important work, but the leaders as well.

#### THE BEST TYPE OF HOSPITAL SHIP.

THE type of ship most appropriate for the purpose of a hospital ship is one on the general plan of a modern mail steamer of the best class, of good size, and capable of maintaining a continuous sea speed of not less than 18 to 20 knots, so as to keep station with a modern fleet proceeding at full speed. The wards should occupy the centre and forward parts of the ship, where nowadays is placed the first-class accommodation in mail steamers, thus insuring a liberal supply of fresh air, light and deck space. It would be well to limit the accommodation of each ship to 500 cases, so as not to involve too large a staff and consequent difficulties in finding sufficient room for their due requirements and convenience. With a ship thus equipped for the purpose of active service, and by strict attention to all other details which ensure complete asepsis, it will be possible to remove completely the stigma formerly attached to hospital ships, which have been used in connection with military operations from a seaboard base.—*Dr. Philip Randall, in the Journal of the Royal United Service Institution.*

## Reprints and Translations.

### TWO NEW LITTERS FROM INDIA.

By MAJOR W. O. KIRKPATRICK, I.M.S.

THE author presents a chair litter and a sling chair for use in hill warfare and for carrying the wounded back from the first line to the dressing station. These are well shown in the illustrations which are reproduced from the *Journal of the United Service Institution of India*.



Chair Litter, Front View.

or shortened at will by the bearers, to suit their height and length of arm. (5) Two side pieces of newar, sewn to which are two transverse chest and back pieces; the injured man is then supported on all sides. The newar side pieces can be lengthened or shortened as required so as to support and retain the injured man properly during either ascent or descent. (6) Four

The materials required for construction of the Chair Litter are, (1) Two poles, each five feet long—preferably of male bamboo four inches in circumference. (2) One “gunny” ration, bag, folded double and sewn, to form a seat 19 inches square. (3) One cross strut of metal to keep the poles apart and the seat taut. (4) Four shoulder braces of country webbing (“newar”),—these braces can be



Chair Litter, Rear View.

strips of sheepskin (sewn inside shoulder braces) to save the shoulders of the bearers. (7) One newar stirrup. (8) Two newar "tags" or attachments, to secure wounded man's rifle.

The Sling Chair is not as well suited for hill work as the chair litter, but would be better than nothing at all, as it is very light ( $4\frac{1}{2}$  lbs.) One or two such chairs could be sent with every hill piquet or detached party liable to find themselves with a sick or wounded man on their hands and no stretcher within reach.



Sling Chair, Front View.

To construct this, the following materials are required: (1)

Two poles,

(bamboos for choice) each two feet long. (2) Ration (gunny) bag, seat 19 inches square. (3) Two shoulder braces of "newar," with transverse chest and back pieces, and arm pieces connecting the two latter. (4) Two bamboo handles, connected

with the seat by rope lacing. (5) One newar stirrup. (6) Four strips of sheepskin (sewn inside the shoulder braces) to save the shoulders of the bearers.



Sling Chair, Rear View.

# Medico-Military Index.

## MILITARY HYGIENE.

**Alvernhe.** [Sanitary condition of the principal European armies.] *Arch. de med. et pharm. mil.*, Par., 1903, xli, 351-383.

**Bakitzko (N. F.)** [On the distribution of whiskey in the army.] *Voyenno-med. J.*, St. Petersburg, 1903, i, med. pt., 448-455.

**Barth. (E.)** [Hypertrophy of the pharyngeal tonsils in soldiers and its relation to hypertrophic rhinitis and chronic pharyngitis.] *Arch. f. Laryngol u. Rhinol.*, Berl., 1903, xiv, 82-98.

**Blecher.** [Cause of swelling of feet in soldiers.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 3-22.

**Bonne.** [On the military importance of maintaining our German water supply pure and wholesome.] *Gesundheit*, Leipz., 1903, xxviii, 225; 263.

**Boullier (G.)** [On the preparation of soup destined to replace the morning coffee.] *Arch. de m'd. et pharm. mil.*, Par., 1903, xli, 465-472.

**Brandenburgensis.** [On the question of military dentists.] *Deutsche zahnärztl. Wchnschr.*, Wiesb., 1903, v, 549-556

**Caldwell (R.)** Soil pollution and disease in camps. *Brit. M. J.*, Lond., 1903, i, 248.

**Deleito (F. G.)** [Treatment of syphilis in military hospitals.] *Rev. de san. mil.*, Madrid, 1903, xvii, 41-45, 101-105.

**Demmler, (A.)** Proposition for sanitary reform in the army.] *Allg. mil.-ärztl. Ztg.*, Wien., 1903, 1-4.

**Drouineau (A.)** [Influence of cooks on the health of troops.] *Caducée*, Par., 1903, iii, 73.

**Drouineau (A.)** [Remarks relative to the distribution of bread in a body of troops.] *Caducée*, Par., 1903, iii, 132.

**Dumas (A.)** [The Conseil de revision and the barrack; their rôle in the mortality of the French Army.] *Rev. scient.*, Par., 1903, 4s., xix, 73-78.

**Finne (G.)** [The consumption of medicine in military life.] *Norsk Tidsskr. f. Mil.-Med.*, Kristiania, 1901-2, vi, 68-74.

**Fischer.** [Influence of place for sleeping upon infectious diseases.] *Militärarzt*, Wien, 1903, xxxvii, 68.

**Freund (H.)** A sanitary proposition for the manœuvres.] *Militärarzt*, Wien, 1903, xxxvii, 4.

**Freund (H.)** [Professional diseases of officers.] *Militärarzt*, Wien, 1903, xxxvii, 54; 69.

**Georges (L.)** [Civil and military mortality.] *Arch. de med. et pharm. mil.*, Par., 1903, xli, 393-425.

- Godin (P.)** [Influence of cooks upon the health of troops.] *Caducée*, Par., 1903, iii, 120.
- Lees (J. F.)** The supply of pure water to troops in the field. *Brit. M. J.*, Lond., 1903, i, 249.
- Lindemann (F.)** [Our military shoes.] *Norsk Tidsskr. f. Mil-Med.*, Kristiania, 1901-2, vi, 179-181.
- Jourdin.** [On the physical and moral value of volunteer troops.] *Caducée*, Par., 1903, iii, 105.
- Majewski (K.)** The question of beds in sanitary formations in the field.] *Krankenpflege*, Berl., 1902-3, ii, 626-629.
- Martin (M. A.)** [Conditions which should be fulfilled by candidates for the military schools in regard to their eye-sight.] *Rec. d'opht.*, Par., 1902, 3. s., xxiv, 705-709.
- Micela (S.)** [Fatigue, atmospheric heat and sunlight in relation to the soldier on the march.] *Gazz. d. osp.*, Milano, 1903, xxiv, 403-407.
- Neumann.** [Social significance of military medicine.] *Med. Reform.*, Berl., 1903, xi, 165.
- Pedraza (E.)** Gonorrhoea in troops.) *Med. mil. españ.*, Madrid, 1902-3, ix, 152-155.
- Pilet.** [On the water used by the garrison at Termonde.] *Arch. méd. belges*, Brux., 1903, 4. s., xxi, 88-96.
- Popelski (L. B.)** [Physiological foundation for rational apportionment of the food ration.] *Voyenno-med. J.*, St. Petersburg, 1903, i. med. pt., 521-530.
- Richardson, (A. B.)** Insanity among soldiers of the American army in the Philippine service. *Phila. M. J.*, 1903, xi, 216.
- Rolland (E.)** Military reasons for prevention of vicious attitudes of children during school work.] *J. de méd. de Bordeaux*, 1903, xxxiii, 273.
- Romeyn (J. A.)** [Contributions from the "Dépôt van discipline" at Vlissingen."] *Mil. geneesk. Tijdschr.*, Haarlem, 1903, vii, 1-13.
- Saint-Paul (G.)** [Military hygiene: the roll-sac.] *Ann. med.-chir du centre*, Tours, 1903, iii, 21-23.
- Salazar (M. M.)** [Military hygiene of dysentery.] *Rev. de san. mil.*, Madrid, 1903, xvii, 121-127.
- Schultzen.** [Application of balneologic measures and use of health resorts in the army.] *Deutsche med. Wchnschr.*, Leipz. u. Berl, 1903, xxix, 305; 323.
- Shapiroff (B. M.)** [Accepting recruits.] *Vestnik obsh. hig. sudeb, i prakt. med.*, St. Petersburg, 1903. pt. 2, 394-399.
- Shokhor, (D.)** [Results of examination of the teeth of the enlisted men of the second squadron, thirty second regiment of dragoons.] *Zubovrach, Vestnik*, St. Petersburg, 1903, xix, 41-44.
- Shitsheglaff (A. L.)** Mental diseases and criminality in soldiers.] *Voyenno-med. J.*, St. Petersburg, 1903, i. med. pt., 671-686.
- Sickinger (A.)** [On the necessity of dentistry in the army.] *Med. Reform*, Berl., 1903, xi, 139-142.

## Editorial Department,

---

### THE EDUCATION OF THE MEDICAL OFFICER.—THE ARMY MEDICAL SCHOOL.

**T**HE Surgeon General of the Army, with the approval of the Secretary of War, is arranging for the establishment of an institution which shall take the place of the present Army Medical School with more extended field and facilities. The plan makes graduation at the Army Medical School an essential preliminary to appointment to the Medical Corps of the Army, —transforming that institution from a college for military medical officers to a preparatory military medical school. The successful candidates for admission to the new school will be appointed Contract Surgeons in the Army during the continuance of the school term and upon their graduation will be commissioned in the order of standing obtained during the course.

Examinations for admission to the Army Medical School are hereafter to be conducted under the supervision of boards of medical officers at the larger military stations in various parts of the United States and will consist of, (1) the usual physical examination, and examinations upon (2) general subjects and upon (3) professional subjects, the questions for which will be uniform and sent from the Surgeon General's office. Candidates in addition to being physically sound will be required to be between twenty and thirty years of age, citizens of the United States and graduates of reputable medical schools. They must present certificates of character and standing in the community and have had at least one year hospital service or its equivalent in practice. They must moreover agree that in case they are found qualified they will accept commissions as Assistant Surgeons in the United States Army and serve five years unless sooner discharged.

The general examination to which candidates will be admitted after being found physically qualified upon careful inspection, will consist of written examinations upon, mathematics (arithmetic, algebra and plane geometry), geography, history, (especially of the United States), general literature, Latin grammar and easy Latin prose reading. Special proficiency in the natural sciences will be accepted in lieu of a knowledge of Latin. English grammar, orthography and composition will be determined from the candidates' examination papers.

The professional examination, also written, will then follow, —covering anatomy, physiology, chemistry, materia medica and therapeutics and normal histology.

Candidates receiving a mark of not less than 80 per cent. in these examinations will be eligible for admission to the Army Medical School in the order of relative standing. The successful candidates will receive contracts calling for a monthly pay of \$100.00 with no other compensation or allowances except the usual travel pay for officers when traveling under orders. They will then be ordered to duty at the Army Medical School in Washington for instruction.

The course in the Army Medical School instead of being a four months' course as heretofore, will be extended to cover the usual school year from October 1st to May 31st. At the close of the term the students in the school will be examined in the courses taught therein and in surgery, practice of medicine, diseases of women and children, obstetrics, hygiene, bacteriology, and pathology, with marks also in general aptitude for military medical service as determined by their work at the school. Candidates claiming a knowledge of ancient or modern languages, higher mathematics or scientific branches other than medical will have the option of examination in such subjects, receiving due credit therefor in the determination of relative class standing.

The candidates standing the highest in this examination, who have received a mark of 80 per cent. or over, will be selected in the order of their standing to fill vacancies in the Medical Department and be recommended for commissions. Those receiving 80 per cent or more, but who fail to enter the Corps for lack of



vacancies; will receive certificates of graduation at the school and will be preferred for selection for volunteer commissions and for contracts. The Surgeon General will reserve the right to annul the contracts of candidates found undesirable at any time after the preliminary examination.

This plan has been the subject of very careful consideration by the Surgeon General for a long time and the faculty of almost every medical college in the country has been consulted with reference to it, with a result in each case of most hearty approval. Its principal advantages are that:

1. The test for admission to the Medical Corps of the Army will be thorough, absolutely fair and strictly competitive from beginning to end, so that the best men will be obtained for the service.
2. It will allow of close observation of candidates for commission by which their aptitude for service can be accurately ascertained which has hitherto not been practicable.
3. It will furnish a number of trained physicians, who, failing to obtain vacancies in the Medical Corps, will be available for appointment as Contract Surgeons, Medical officers of the National Guard, and in time of war as Volunteer Medical Officers of the United States Army and—
4. In addition will tend to diffuse a knowledge of military medicine, surgery and hygiene among the physicians of the country at large.

The scheme as outlined is a novel one and possesses to a marked extent the qualities of breadth, strength, and practicability. The Surgeon General believes that it will prove attractive to the best talent among the young physicians of the country and that the school advantages will be eagerly sought even in years when there is little chance of securing a commission. It will be inaugurated in the Spring of 1904, when the examining boards will be appointed preliminary to the actual work of the school which will open in the Autumn following.

## THE UNITED STATES ARMY MEDICAL EQUIPMENT.

THE following circular issued from the War Department, September 3, 1903, is of so much importance to medical officers of all services that it is published in full.

Referring to so much of the act of Congress approved March 2, 1903, entitled "An act making appropriation for the support of the Army for the fiscal year ending June 30, 1904," as makes an appropriation to furnish the organized militia of the several States and Territories and the District of Columbia with the same armament and equipment as now prescribed for corresponding branches of the line or staff in the Regular Army, etc., the attention of all concerned is invited to the following considerations in preparing requisitions for *medical equipment*:

As the purpose of this act is to secure uniformity of equipment, it is of the utmost importance that the supply table of the Medical Department, U. S. Army, as given in the Medical Manual, 1902, should be exactly followed. If a sufficient amount of the appropriation accredited to the State is not allotted to the Medical Department to permit of the purchasing of a complete medical equipment, it is suggested that regimental hospital outfits be first asked for, each outfit being complete in itself. In succeeding years, after all regiments have the appropriate regimental equipment, equipments for field hospitals and ambulance companies may be obtained. Parts of regimental or field hospital outfits should not be asked for, except detached service chests (paragraph 305) and the articles for the personal equipment of medical officers and men of the Hospital Corps. The organization for the medical service of a regiment, a battery, battalion or squadron, an ambulance company and a field hospital is given in paragraph 60, Medical Manual, and is as follows:

1. FOR BATTERY OF ARTILLERY, DETACHMENT OF INFANTRY, OR SQUADRON OF CAVALRY—

Personnel; 1 medical officer, 2 privates Hospital Corps, one being an orderly, the other an ambulance driver. The personal and medical equipment would be—

One medical and surgical chest for detached service (paragraph 305)	\$87 10
One case, field operating, small (paragraph 306), for medical officer,	22 75
One pouch, orderly (paragraph 273).....	22 53
One pouch, Hospital Corps (paragraph 272).....	6 03

2. FOR A REGIMENT—

Personnel: 3 medical officers, 3 noncommissioned officers, 9 privates.

Equipment for personnel:

Three cases, operating, small, carried by medical officers.....	68 25
Three cases, emergency (paragraph 249), carried by noncommissioned officers.....	36 00
Three pouches, orderly (paragraph 273) one for each medical officer's orderly.....	67 59
Six pouches, Hospital Corps.....	36 18
Regimental hospital outfit as enumerated in paragraphs 319-320.	
Total cost regimental hospital, including personal equipment above mentioned.....	1,233 08
For each brigade will be organized an ambulance company and a field hospital.	

### 3. FOR AN AMBULANCE COMPANY—

Personnel: 3 medical officers, 1 detailed line officer as quartermaster, 13 noncommissioned officers, 48 privates.

Equipment for personnel:

Three cases, field operating, small.....	\$68 25
Thirteen emergency cases.....	156 00
Three orderly pouches.....	67 59
Forty-five Hospital Corps pouches.....	271 35
Equipment for ambulance company at dressing station, as enumerated in paragraph 328.....	608 56

### 4. FOR A FIELD HOSPITAL—

Personnel: 3 medical officers, 1 detailed line officer as quartermaster (paragraph 55a), 4 noncommissioned officers, 35 privates.

Equipment of personnel.

One case, operating, field, small, for each medical officer.

One emergency case for each noncommissioned officer.

One orderly pouch for each orderly.

Thirty-one Hospital Corps pouches.

The equipment for a field hospital, with reserve supply of medicine for three months, is enumerated in paragraphs 289, 290, 291, 293, 295, 302, 303, and costs.....

The equipment furnished by the Quartermaster's Department is enumerated in paragraph 316, and costs, exclusive of horses and wagons.....	\$7,146 27
	1,252 67

Total cost of field hospital complete..... 8,398 94

In making requisitions it should be stated under the head of remarks what serviceable standard field equipment, if any, is on hand, and the requisition should call for such articles as added to those on hand will make complete units as described above under the headings 1, 2, 3, and 4.

A UNITED STATES NAVAL MEDICAL OFFICER AT  
THE BATTLE OF CIUDAD BOLIVAR.

THE Navy department gives out a letter addressed by the Secretary to Surgeon James Chambers Pryor, U.S.N., remarking that, "The Department takes pleasure in commending you for your intelligent and untiring efforts in the interest of humanity in rendering aid to the numerous wounded of the opposing forces [in Venezuela in July, 1903]. The assistance rendered by you undoubtedly saved many of the wounded from death and diminished much suffering. The Department congratulates you on having made this record of efficient performance of your duty to humanity as well as to the service of the country to which you belong." The services referred to by the Secretary were rendered by Dr. Pryor during the capture of Ciudad Bolivar by the government forces of Venezuela, at which time there were several hundred dead and wounded soldiers in the town and suburbs. Dr. Pryor improvised a hospital in one of the public buildings and sent out searching parties of men from the *U.S.S. Bancroft* who brought in the injured from all directions. He received a certain amount of assistance from two Venezuelan doctors and from the Surgeon of the French gunboat *Jouffroy*, but he personally performed sixty-six operations, many of them of a grave nature, and for an entire day and night was unremitting in his attention to the wounded.

---

LIEUTENANT COLONEL CHARLES F. W. MYERS.

IT is with profound regret that the death is announced of Lieutenant Colonel Charles F. W. Myers, N.G.N.J., of Paterson, N.J., a charter member of this Association and for the greater period of its existence a member of the Executive Council. Colonel Myers had been ill for a number of years and his demise though untimely was not entirely unexpected. His place upon the Executive Council has been filled by the appointment of Captain Myles Standish, M.V.M.: Boston, Mass.

---

## A FURTHER CONSIDERATION OF THE NECESSITY FOR IMMEDIATE CELIOTOMY IN PENETRATING GUNSHOT WOUNDS OF THE ABDOMEN IN WAR.

BY CAPTAIN CHARLES EDWARD BELIN FLAGG,  
ASSISTANT SURGEON IN THE UNITED STATES ARMY,

**A**S it is not my object to convert anyone to my opinion, it was my intention to refrain from further discussion of this subject before the Association but at the instance of our esteemed president I submit this paper.

It would seem from the discussion elicited by my paper at the 1901 meeting\* that a more explicit statement of my views is advisable. I was not then present to take part in the discussion.

1. It is not my intention to urge the necessity for immediate operation in penetrating wounds of the abdomen as I am aware that this question has been answered affirmatively by the consensus of surgical opinion and can hardly be considered as open at this date of discussion by a body of surgeons, military or otherwise.

In civil surgery a case of supposed penetrating gunshot wound of the abdomen demands immediate exploration. If there is doubt as to penetration the wound is laid open and if it is found that penetration has taken place further exploration is imperative.

The same rule applies to military surgery. No larger per cent. of these cases occurring in war will recover if left untreated than of those occurring in peace.

In civil surgery we do not wait to find out whether the man was shot by a steel jacketed small caliber bullet that may have made a small aseptic hole in the intestine or that may not have wounded the intestine.

By what processes of reasoning then is this urged on military surgeons?

---

*\*Journal of the Association of Military Surgeons of the United States, vol. X, No. 1, August, 1901, pp. 110-116.*

It is not desirable to have cases transported after celiotomy. But they must be transported. What is the alternative? Let them alone. Transport them with holes in their intestines and let them die without operation or after an operation that has been delayed so long that only the inexperienced will undertake it.

But the necessary conditions can readily be secured in war on the battle field.

In civil life these cases are not operated upon in the street or road where they fall. They are taken to a hospital or a house.

Military hospitals are established as near the firing line, where the men are shot, as circumstances permit, frequently near enough to get these cases in a short time.

The rule of civil surgeons in such cases applies with equal force to the military surgeon. Let the military surgeon see that there are not too many exceptions to this rule of his work. There is no contrary rule in military surgery behind which he can excuse himself. An analysis of the records and of the reported cases will show it.

2. This is most difficult surgery and requires for its successful performance trained men.

Civil surgeons will find this work difficult because of their changed surroundings since they are not accustomed to establishing hospitals in the preparation for these operations.

A military surgeon accustomed to foresee the exigencies that may arise and to provide himself against these exigencies; one who knows what he is allowed in given cases and how to secure his full allowance; how to keep this allowance with him; such a surgeon, if he is trained in abdominal work, is the best man to care for these cases.

As to the remarks of General Griffith, I submit, first, his statement:

"But I do think that under these circumstances there is no rule because it is a very hard matter to acquire just what is necessary; in other words to get a tent, to find a house, or get up to a temperature of 88 or 96, which is preferable in laying a belly wide open and frequently hunting for half an hour or more for an opening you may have left; in other words you have to strip the gut from one end to the other. Your humble servant has

been placed in this position and knows thoroughly what it means, and I can assure you that when at the post mortem examination I have found that I left a wound unattended to it caused a feeling of chagrin when the coroner made his report. Now let me say, this non-interference with abdominal wounds on the firing line was probably fashionable in the Spanish-American running match. Is that right? I can assure you, gentlemen, that when Nicholas Senn spoke of this matter so forcibly he meant that the surroundings were such that it could not be done scientifically. Dr. Senn will probably himself tell you that he has hunted for an hour for one of these wounds of the gut. The smaller the wound the harder it is to find. And then again, every man who has gone into this kind of thing, (and I see one or two gentlemen who have, especially from my own city,) will tell you the same thing, that it is hard to surround yourself with just what you want. Asepsis is not an easy thing to get under such conditions. In an operating room you have every requirement you need, all the scrubbrushes, hot and cold water you want."

In reply I answer: Granted there is no rule under these circumstances, then the old military rule to let these cases die if they will, or if through the grace of God and the neglect of man they do live, to report them as recovery of penetrating gunshot wounds of the abdomen in which the intestine must have been injured, without operation, should not apply.

It is said in the paper that it is very rare that a house or tent is available in these cases. It is the duty of the surgeon to have the tent or to find the house before the engagement. It is not difficult in the Philippine islands, at least, to get the proper temperature. You will have to hunt no longer there or on a battle or other field for holes in the intestine than you will in the United States in time of peace. Would the chagrin of General Griffith in the case he alludes to in which the coroner found the hole he overlooked, have been any less if he had not operated and the coroner had found all the holes?

Reference to the Supply Table for the Medical Department, U.S. Army, will show six scrubbing brushes in the regimental sterilizing chest. It is the duty of the surgeon to have these with him in the field. Two would be sufficient in case of emergency. Cold water is abundant in the Philippines and, as General Griffith says, you have only to boil it to make it clean.

I hardly know how to answer Colonel Fitz Gerald's remarks and at the same time confine myself to the points intended to be presented in my paper; however, as every phase of the subject is of much interest to the military surgeon I will digress sufficiently to discuss these remarks which are here quoted :

"I concur with the remarks of Colonel Hoff. After twelve months in the tropics, doing work in the abdomen following gunshot wounds I found the best results obtained were in those cases that were treated on the expectant plan. It was found that where early operation was resorted to you not only had the shock of the primary wound, but that also of the following operation, and it was found that in a large percentage of the cases they ultimately succumbed, not only as the result of the shock, but as the result of early interference. The rule followed by myself and others at Manila,—and I would first add that nearly ninety-five per cent of the wounded were immediately passed to the first reserve hospital in Manila during the first three months of the insurrection, and we had ample opportunity to observe the results of the treatment of these cases, but the rule was invariably followed to allow the patient sufficient time for reaction: and sometimes if hemorrhage did not exist it was found necessary to make an opening large enough to establish drainage, and drainage was made in the abdomen, and this treatment gave the best class of results. Nearly all cases that were operated on early after the injury died, but a fair percentage of the cases treated as I have mentioned made a fair recovery. In many cases subsequent operations were necessary, but in the ultimate the results were fair. I do believe, as the author of this paper should know from experience in the Philippines, that an early operation is certainly contradicted and is condemned by every man who has had experience in this line."

Records of the Surgeon General's office (pages 261-262 of this paper) show that two cases (Nos. 5 and 7) of celiotomy for gunshot wounds of the abdomen were done in the First Reserve Hospital between June 30, 1898 and June 30, 1900. The reports of both cases are signed by Major Crosby. I have been unable to learn whether Col. Fitz Gerald did one or both operations, and if both whether he did an early operation on one and late drainage on the other. In any case both died and hardly justify conclusions as to the best time to operate.

In a base hospital of the U.S. Army, in a city the size of Manila, with trained nurses, a well appointed operating room, skill-



ful operators, and all the conveniences to be desired, the question of immediate operation in gunshot wounds of the abdomen is not different from the same question in civil life in hospital, and I doubt if Col. FitzGerald can find many civil surgeons to agree with his treatment. A glance at the Supply Table, Manual Medical Department U.S. Army, 1900, will indicate that appliances are not lacking in a base hospital and if we have to acknowledge that our medical department does not equip its base hospitals sufficiently to warrant any operation whatever its nature being performed there at any hour during the night or day it is certainly time for this Association to take steps to remedy this condition. I am not willing to acknowledge it. I have not found it so. I have seldom lacked instruments or appliances on or off the field. If any operator finds any special instrument or appliance necessary and does not care to purchase it himself the Surgeon General will approve a special requisition for it and have it supplied. That is my experience. This question of waiting for patients with holes in their intestines to recover from shock produced by these holes and likewise of patients suffering from shock from hemorrhage to react before sewing up the holes or stopping the hemorrhage, has been settled and it is not my wish to discuss it. The author of the paper, Dr. Flagg, does not know and did not see or hear of anything in the Philippines to convince him that early operation is "certainly contraindicated," etc., etc.

Colonel Hoff has stated in the discussion "\* \* \* \* I am opposed to diagnostic explorations on the firing line, and I believe ninety-nine one hundredths cases could be determined on simple diagnostic principles." I have not heard of any diagnostic principles, except exploration, that are applicable to these cases if it is intended to aid them by the diagnosis. These cases that die in a few moments after being shot may be diagnosed in a way by looking at them but those possibly amenable to surgical treatment do not bear waiting until those diagnostic principles can be applied. The time of those competent to apply these principles would be used to some purpose if it was employed in the application of rational treatment instead of tedious and impotent watching required for diagnosis which when accomplished can only aid in a prognosis which it is then too late to improve by action.

This question can not be disposed of by any man's opinion that there is not time, that asepsis can not be secured, that there is too much confusion, too much other work, or that this operation was not attended with marked success in the civil war, etc.

The facts in the case are what are wanted and in reviewing them a careful analysis is necessary. Each case reported must be examined with all the light that can be brought to bear upon it. In war as in civil life the attendant circumstances differ widely in each case and it is evident that much harm has been done this question by accepting statistics as quoted, without analysis of the individual cases.

Historically, I record with justifiable pride that my native state, South Carolina, furnished the surgeon who was "first in the world to open the abdomen as a restorative operation in cases of gunshot wound, with a view to restoring the intestines." This was in 1862. Brant and Fuller's Encyclopedia, Vol. 1, page 331, was quoted by Edward F. Parker, M.D., in his prize essay, *A history of Surgery in South Carolina*, April 1893. "The subject was a Confederate soldier, who had been wounded in the abdomen some time previous. Dr. Kinloch performed laparotomy successfully in Summerville, resecting the intestine and suturing it again with the object of restoring its continuity. The patient lived many years afterward."

The late Robert A. Kinloch was a man of action and a surgeon of renown. A man of such character and ability will create conditions favorable to abdominal work on the battle field and will successfully surmount obstacles judged by others insurmountable.

The annual reports of the Surgeon General to the Secretary of War for the fiscal years ending June 30, 1899, 1900, and 1901, show that sixteen cases of perforating gunshot wounds of the abdomen were operated upon by army surgeons during that time. Of these sixteen, thirteen died and three recovered.

■ An analysis of these cases is well worth the time and has been rendered possible here by the courtesy of the Surgeon General who has furnished me a copy of the records in his office per-

taining to them, and by personal letters from the operators as herein noted.

REPORT OF SURGEON GENERAL, U.S.A., JUNE 30, 1899, FOUR CASES OPERATED ON.

1. Wm. B. C., Hosp. Corps, U.S.A.—Laparotomy, colon sutured, December 29, 1898. 2nd Division Hospital 7 A. C., Havana, Cuba. Report signed by Major Ira C. Brown, Surgeon U.S.V. Death January 3 (?), 1899. Not on "firing line." In a hospital in a large city.

2. J. H., 9th Cavalry.—Laparotomy, October 18, 1898. Fort Huachuca, A. T. Report signed by Major Wm. W. Gray, Surgeon U.S.A. Death October 24, 1898, (In a Post Hospital, in the United States.) (The Records of this hospital give the following additional information: Perforating gunshot wound of abdomen. Bullet .38 cal. Point of entrance 2 inches to point of umbilicus. Eight perforations of intestine. Point of exit 1 inch to left of lower third of sacrum.)

3. L. K. 22nd Infantry.—Bullet extracted July —, 1898. Siboney Reserve Division Hospital, Cuba. Report signed by Major Louis A. La Garde, Surgeon U.S. Army. Discharged S. C. of D.

(U.S. Soldiers' Home, Washington, D. C., January 7, 1902. Private L. Kupfer late Co. H 32nd Infantry, is at present working in the dining room at this home. He was wounded at El Caney, July 6, 1898, ball entered left groin just inside anterior superior spine of illum and was cut out below and external to latter. The ball did not penetrate bone or abdominal cavity. Operator unknown.)

4. Wm. B. (C?) Pitey, (Piety?) 8th Infantry. Bullet extracted July 18, 1898. Fort Monroe, Va. Report signed by Major Calvin DeWitt, Surgeon U.S. Army. Death July 23, 1882.

(Major, now General, DeWitt, January 6, 1902, writes as follows:

\* \* \* I cannot find any information concerning the extraction of a bullet from Pvt. William B. Piety, Co. C 8th Inf. The bullet if removed at all was taken out at the Reserve Div. Hosp. 5 A. C. Siboney—of this hospital Major LaGarde, Surgeon U.S.A., had charge—Major LaGarde is in the office of the writer, and states he does not recall such case: the records show that Pvt. William C. Piety died of "Typhoid Fever" at Fort Monroe,—whether in the U.S.A. Gen. Hosp. there or the Josiah Simpson U.S.A. Gen. Hosp. near there I of course cannot say—and it is just possible there may have been two W. C. Pietys, the probability that both were privates in the same company at the same time is very doubtful.

REPORT OF SURGEON GENERAL U.S.A., 1900, FIVE CASES OPERATED UPON.

5. Wm. E. H., Band 23rd Inf, Laparotomy. 1st Reserve Hospital Manila, P. I. Report signed by W. D. Crosby, Major and Brig. Surgeon, U.S.V. Death April 6, 1899.

(In a fixed Base Hospital. I have failed to learn the time elapsing between receipt of injury and operation.)

6. Chas. M. S., 1st Lieut. 48th Inf. Laparotomy. First Separate Brigade Hospital, Illoilo, P. I. Report signed by Major Herbert W. Cardwell, Chief Surgeon, U.S.V. Death November 22, 1899. (In a fixed hospital. No other information obtainable.)

7. F. G. A., Co. C 23d Inf. Laparotomy. First Reserve Hospital, Manila, P. I. Report signed by Major W. D. Crosby, Brig. Surgeon, U.S.V. Death April 1, 1899.

(In a fixed base hospital. I have failed to learn the time elapsing between receipt of injury and operation.)

8. Chas. E. W., K, 13th Inf. Bullet extracted November 14, 1899. Brig. Hosp. San Fabian, P. I. Report signed by A. A. Surgeon R. H. Zauener, U.S.A. Death November 16, 1899.

(It can be assumed that this was not a celiotomy.)

9. J. C. H., F, 1st Nebraska V.I. Bullet extracted. Santo Tomas, P. I. Probably Regimental Surgeon. Death May 5, 1899.

(It can be asumed that this was not a celiotomy.)

REPORT OF SURGEON GENERAL U.S.A., JUNE 30, 1901, FIVE CASES OPERATED UPON.

10. J. P. R., C 12th Inf. Laparotomy. Military Hospital, Angeles, P. I. Report signed by 1st Lieut. D. F. Duval, Asst. Surg. U.S.A. Death December 4, 1900.

(In a fixed hospital. No other information obtainable.)

11. P. M., B, 4th Cav. Laparotomy. Hospital Ship Relief. Operator Major H. O. Perley, Surgeon U.S.A. Death January 12, 1900.

(Operating Room and conditions compare favorably with best civil hospitals. No other information obtainable.)

12. J. P. D., L, 9th Cav. Celiotomy. Fort Grant, Arizona. Operator Captain Chas. E. B. Flagg, Asst. Surgeon U.S.A. Duty December 18, 1900.

Diagnosis: Gunshot wounds: a. Through center left arm, front of humerus: entrance external surface, exit internal surface; flesh wound.

b. Left side chest, entrance in posterior axillary line between tenth and eleventh ribs; left pleural cavity penetrated; left kidney wounded; ileum abraded in three places.

Missile: Bullet cal. .38, U.S.A. Range, one or two meters. A prisoner. Having escaped from sentinel at the post October 23, 1900, was shot by a member of a pursuing party about four miles from post.

First aid dressing applied by operator at place of injury. Soldier was brought to hospital over rough road in a spring wagon.

Physical examination: Heart normal. Lungs normal except for wound.

Blood in urine as shown below. Complained of considerable pain. Shock was very moderate.

*IMMEDIATE CELIOTOMY IN GUNSHOT WOUNDS.* 263

October, 1900.		<i>Clinical History.</i>	
A. M.	P. M.		
		23	Wounds cleansed. Wound in chest explored under ether.
		3 P. M.	Slit like opening into pleural cavity. No opening in diaphragm found.
			R Strych. S. .002 t. d., per orem. } Pain l. side. No bowel
			R Strych. S. .0006, hypod., every } movement on 23d.
			4 hrs. Abdomen tympanic.
99.8		24	3 p. m. Operation. Ether. Abdomen opened through incision 11 cm. long, commencing at junction of lower border of ribs and quadratus lumborum and extending parallel with external oblique. Congested and distended coils of ileum with three small wounds, not penetrating, protruded. The abrasions were sutured with mattress, cotton, sutures. The abdomen was closed with bichloride alcohol catgut and silkworm gut.
99.8	101	25	R Mag. Sulph. 30. 7 a. m. R Mag. S. sat. sol. 4. o. ½ hr. till passage. Continue Strychnine.
			R Mag. S. 60. sat. sol., Ol. Ricini, in Aq. 120. per enema, high rectal.
			R Hydrarg. Chlorid. mit. .325. Sod. Bicarb. .650.
			Repeat enema 5.30 p. m., adding Ol. Olivae 30. Restless last night.
99.8	100.6	26	R Felis bovis 8., Mag. S. 120., Ol. Ricini 60., Ol. Olivae, Alum. 8., in Aquae 500. High enema 9.30 a. m.
			Free liquid evacuation. Complains of some pain at wound.
99	99.6	27	R Repeat enema. Good results.
99	100.8	28	Wound in chest dressed every other day.
99	100.4	29	One bowel movement. R. Hg Chl. mite. .006, Sod. bi-carb. .132 q. h. till bowels move.
99.2	100.6	30	No b. m.
100.6	100.2	31	One b. m.
		Nov.	
99.2	100.6	1	R Mag. S. 30.
98.8	99.6	2	One b. m.
98.2	99	3	No " "
		4	Abdominal wound dressed. Primary union.
		17	Stitches removed.
		12	Wound in chest dressed with Acetanilid 1 part and tannic acid 2 p. Temperature has been normal since 3d.
			No pain.
		19	Quarters.
		Dec.	
		18	Duty.
		27	Private D. sent to military prison Alcatraz Island, Cal, from which place he escaped.

## URINARY EXAMINATIONS OF PRIVATE J. T. D,

1900.

Oct.

- 24 Reaction, acid. Sp.gr. 1.032. Much albumen. Blood.
- 25    "    "    "    1.030. Less albumen    Blood, hyaline casts, mucus corpuscles
- 37    "    "    "    1.023 Albumen. Few blood cells, few granular casts.

Nov.

- 1    "    "    "    No albumen. Occasional red blood cell, very few pus cells.

13 W. J. B., H, 47th V.I. Laparotomy. Near Ligao and Guinabatan, P. I. Probably regimental Surgeon. Death April 13, 1900. (No other information obtainable.)

14. B. F. W., 40th V.I. Laparotomy. Cayagan, Mindanao, P. I. Probably Regimental Surgeon. Death April 9, 1900. (No other information obtainable.)

NOTE.—Report of S. G., June 30, 1900. Two cases of gunshot wound penetrating abdomen appear, one of which is tabulated as fracture of spine, and reported by Captain Chas. E. B. Flagg, Asst. Surgeon U.S. Army, as celiotomy for gunshot wound.

The other reported by Dr. Flagg, case of insane Filipino, gunshot wound of abdomen. celiotomy, suture of intestine.

These cases are additional to the five above reported.

15. Pvt. M., 17th Inf. Shot through right side of chest and abdomen (Mauser) penetrating lung and grooving liver. Wounded at Masapinit near Tinebang, a barrio of Magellanes, P. I., the forenoon of November 10, 1899. The abdomen was opened in the right lumbar region at the wound of exit an hour or so later. From the exit and entrance wounds it seemed probable the liver and other abdominal organs had been perforated. There was considerable shock.

A groove was found in the liver, and the intestines which were carefully examined, were uninjured. The case was transported some  $2\frac{1}{2}$  or 3 miles in an ambulance to the church at Rosario where I had the day previously established the regimental hospital. Here he was operated upon. Before the soldier had recovered from the ether it was necessary to put him in an ambulance and send him to the brigade hospital at Malabacat 4 or 5 miles distant. From there he was transferred the next day over a rough road to the Division Hospital at Angeles where Dr. Reaber (?) took charge of the case. The man recovered.

The American troops engaged were two companies of the 17th Infantry who in making a reconnaissance encountered and drove off a large force of insurgents. A battalion of the 17th Infantry was also hurried to the spot as a reserve but was not engaged. The Medical Staff consisted of one Captain and Assistant Surgeon and two contract surgeons. We had left Angeles, the sub-base, five days previously with deficient transportation and three days rations to last at least ten days. Transportation for the Medical Department when we left Angeles consisted of two ambulances and four bull-carts. After first day captured bull-carts afforded ample transportation. We brought a coal oil stove from Angeles and captured oil at Magellanes the first day. This oil we took with us in one of the captured carts. The operating room was a corner of a dilapidated church, partly floored, with a fairly tight roof, curtained off with sheets. This was the only suitable building for a hospital and was turned over to me as a hospital by General, then Colonel Smith, who ordered the troops, two companies, that had occupied it to vacate. The hospital outfit carried from Angeles consisted of two surgical chests No. 2, two medical chests No. 1, one sterilizer chest, malted milk and beef extract, carried in ambulances. (For contents of chests see Supply Table, U.S.A.) A two-burner blue flame coal oil stove, sheets, towels, blankets, first aid packets, and extra dressings. A barrel of malted milk, a Buzzacott field outfit, rations, etc., a blank book, cap, 4 quire, and blank forms lists of wounded.

The first day out all the hospital corps men including the cook were with companies in action and on the march. They reported to me immediately on the cessation of firing for the day and the hospital was established and water boiling before the ambulances which were with the rear guard came up. The water was boiled in captured sugar evaporators.

After this we had enough hospital corps men to allow the cook to keep with his transportation, and to forage (get eggs, chickens, goats, ducks, etc.) for the sick. The command consisted of one regiment of infantry, two pieces of field artillery and one troop of cavalry.

16. Insane Filipino. Celiotomy. Base Hospital Daugapan, P. I. Gunshot wound ascending colon, revolver cal. .38. Operation one hour after in jury. Death in three days. At autopsy numerous lumbricoid worms found in peritoneal cavity. No trace of sutures. January 1, 1900.

Of these sixteen cases we find in twelve celiotomy was performed. Among the twelve cases there is record of one celiotomy on the firing line (case 15, recovery) and two probably on the firing line (cases 13 and 14, death).

The remaining nine cases were operated upon in fixed hos-

pitals, where, if the conditions were not as favorable as in civil hospitals the fault is with the surgeon in charge.

As to the time elapsing between receipt of injury and operation direct information has been obtained in only three cases (12, 5 and 16): twenty-six hours in case 12, about one hour in cases 15 and 16. From the remarks of Colonel FitzGerald (page 258) it would appear safe to conclude that of the two cases reported to have been operated upon at the 1st Reserve Hospital (5 and 7) one was operated upon soon after the injury and that in the other case a longer time intervened.

Of these twelve celiotomies for penetrating gunshot wounds of the abdomen two recoveries are reported,  $16\frac{2}{3}\%$  recovered,  $83\frac{1}{3}\%$  of deaths.

Of the twelve cases, two were known to have been operated upon soon after the receipt of the injury. Of these two, one died and one recovered, a recovery and a mortality of 50%.

These statistics can not be construed as against immediate operation upon cases of penetrating gunshot wounds of the abdomen in war.

The following letter and blank form were sent to some hundred surgeons and through the courtesy of the gentlemen noted below I am able to present their views on this subject.

FORT GRANT, A. T., 1901.

DEAR DOCTOR:

Being desirous of obtaining statistics and opinions from surgeons doing operations in gunshot wounds of the abdomen, for presentation to my colleagues in the army, I take the liberty of asking you to fill out the enclosed blank form to such an extent as you may see fit; the information thus obtained to be presented before the Association of Military Surgeons of the U.S. at its next meeting.

I enclose, herewith, my first paper on the subject.

Any detailed histories of these cases, opinions on the subject or criticisms of my views will be greatly appreciated.

Yours very respectfully,

(Sgd.) CHAS. E. B. FLAGG,  
Capt. Asst. Surgeon, U.S.A.



J. F. BALDWIN, M.D., Columbus, Ohio.

1	2	3	4	5	6	7	8
Number of cases of gunshot wound of the abdomen operated by you.	How long after receipt of the injury did you first see the case?	Length of time intervening between receipt of injury and operation.	Extent of wounds. Viscera injured or not. Missile.	Where was operation performed, at home or in hospital or home?	What assistance did you have? Physicians? Nurses, trained or untrained?	Was patient transported before or after operation, and if so by what means and how far?	Result of operation.
1	8 hours	8 hours	Wound of kidney; retroperitoneal hemorrhage. Enormous pistol bullet.	Home.			Death few hours after operation.
2			Wound 2 <sup>1</sup> / <sub>2</sub> in left of median line 2 <sup>1</sup> / <sub>2</sub> below umbilicus.	Home.	One physician.		Recovery.
3	6 hours	7 hours.	8 perforations of small intestines, 3 of mesentery; perforations within lower 8 feet of ileum. .32 caliber pistol bullet.	Home.	Four physicians.		Recovery.
4	4 <sup>1</sup> / <sub>2</sub> hours	7 <sup>3</sup> / <sub>4</sub> hours	1 section and 10 perforations of small intestines; 8 perforations of mesentery. .32 caliber pistol bullet.	In unoccupied hotel building. Operating table placed on plank. Light poor.	Two physicians.		Recovery.

## COMMENTS ON CASES 3 AND 4 BY DR. BALDWIN.

These two cases, desperate in character and operated on at night and under most unfavorable surroundings, show what may sometimes be accomplished by very prompt and thorough operative intervention.

In each about six hours had elapsed from the receipt of the injury until the commencement of the operation. Silk was used as a suturing material in the first case, and catgut in the second. For several years I have been using catgut exclusively in intestinal surgery, and have had no reason to question its lasting qualities. Have also used it in operations on the stomach without, in any instance, finding it to give way before union was complete.

I am very positive in my opinion that at least in civil practice every gunshot wound of the abdomen should, at the very earliest opportunity, be carefully explored by following the track of the bullet with the scalpel. If there is no penetration, the cleaning out of the track, with the removal of bits of clothing and perhaps of the bullet itself, will be advantageous, while if penetration has occurred, the discovery and proper closure of the intestinal wounds will give the patient practically the only chance of life that he has.

Owing to the uncertainties of complete sterilization in cases in which there has been leaking from wounds of the alimentary canal, the doubt which must always exist as to the tight and permanent closure of the wounds, and the possibility of infection from the bullet itself, buried beyond observation, from bits of clothing carried in by it, or from injury of organs or tissues not directly or noticeably wounded, I have felt it of prime importance to introduce drainage in all such cases, and have never had any occasion to regret the use of this precaution.

*Clinic of W. S. Halsted, M.D., at Johns Hopkins Hospital.*

	EXTENT OF WOUND.	Time from injury to admission.	Time from injury to operation.	Result.	Transfer'd
10019	Perforation of stomach and transverse colon. Wound of entrance midway between crest of ilium and costal margin in post. axillary line.	20 hours.	21 hours.	Recovery.	Fr. Rock Hall, Md.
10168	2 perforations of stomach. Wound of entrance in 8th l. s. near costal margin. Wound of extraction 4 cm. from spine at 12th dorsal vertebrae. Wound of entrance of another bullet on outer surface of left thigh about 6 inches below trochanter.	3½ hours.	4 hrs.	Recovery.	Bro't from Sparrow's Point by train and patrol.
10376	Bullet entered 8 in. above crest of ilium, passing through to the back and lodging under the skin 2 in. to left of last lumbar spine. No perforations.	2 hrs.	3 days.	Recovery.	
10614	5 perforations in ileum. Perforations all within a foot of bowel, 5 cm. below umbilicus and 1.5 cm. to rt. of median line is a bullet wound from which protrudes a mass of omentum 6 cm. long and 2 or 3 cm. thick.	24 hrs.	25 hrs.	Death 7 hours after 2d operat'n	
11137	8 cm. to left of median line, 2 cm. above umbilicus is entrance wound 1¼ cm. in diameter. Sheath of rectus split in one place.	1½ hrs.	2 hrs.	Recovery.	
11221	Over rt. rectus 3-6 cm. above level of umbilicus are 2 wounds of entry. Over liver are wounds of entry of 6 or 8 shot.	9 hrs.	1 day.	Recovery.	
11687	Wound of entrance 4 cm. above pubis, 1 cm. to left of median line. Bullet crossed abd. wall in downward direction between pubic spine.	2 hrs.	3 hrs.	Recovery.	
11989½	Wound 2 cm. from Poupart's ligament and 3 cm. from ant. sup. spine of ileum. 15 or 20 perforations scattered over a distance of 5-6 feet of ileum.	21 hrs.	22¼ hrs.	Death 24 hours after operat'n	
12366	3 perforations of jejunum. 2 cm. from median line on level of upper border of umbilicus is a small punctured wound.	2¼ hrs.	4 hrs.	Recovery.	
Switz'r	7 perforations in small intestines and 2 in rectum. Entrance 7 cm. below ensiform cartilage and ½ cm. to the left.	30 min.	2 hrs.	Death 14 hours after operat'n	

# IMMEDIATE CELIOTOMY IN GUNSHOT WOUNDS. 269

	EXTENT OF WOUND.	Time from injury to admission.	Time from injury to operation.	Result	Transfer'd
2366	Wound of entrance situated 3 cm. within and 2 cm. above rt. iliac superior spine about $\frac{3}{4}$ cm. in diameter. No wound of exit. 7 wounds of intestine and 2 of transverse meso-colon. Peritonitis	2 $\frac{1}{4}$ hrs.	4 $\frac{1}{4}$ hours.	Death 8 hrs. after operation.	Fr. Locust Point.
2709	Wound in rt. iliac region about outer edge of rectus muscle. about 3 cm. from umbilicus. Bullet passed between epigastric artery and internal vena comes. 6 wounds of intestines found.	6 $\frac{1}{2}$ hours.	7 $\frac{1}{2}$ hours.	Death 18 hrs. after operation.	
2718	Large perforation in transverse colon; several small ones in small intestine. Bullet found in psoas muscle.	7 hrs.	7 $\frac{1}{2}$ hrs.	Death 7 days after operation.	
3156	Bullet entered abdomen at costal margin of 10th rib, perforating cardiac end of stomach.	15 min.	2 hrs.	Death 4 $\frac{1}{2}$ hours after operat'n.	
4008	A protruding nuckle of intestine 4 cm. in diameter, to rt. and a little to left of median line below umbilicus.	2 days.	37 hrs.	Death few hours after operat'n	Fr. East Berlin.
4807	Bullet entered abdominal wall in median line, 1 cm. below umbilicus. 3 perforations in jejunum.	9 hrs.	10 hrs.	Recovery.	
5626	Wound 6 cm. below ensiform cartilage and 7 $\frac{1}{2}$ cm. above umbilicus, being 1 cm. to left side of median line. 2 wounds of duodenum and 1 of jejunum.	2 $\frac{1}{4}$ hrs.	3 hrs.	Recovery.	Fr. Taylor Island, Dorchester Co., by boat.
6644	Meso-colon and blood vessels injured. Intestine not injured. Wound of entrance in mid-axillary line 1 cm. below 10th rib.	4 $\frac{1}{2}$ hrs.	7 hrs.	Recovery.	
6964	Bullet entered about 6 cm. above costal margin at 7th or 8th costal cartilage. 2 wounds of liver located, one on upper surface of rt. lobe 10 cm. from anterior border; another on inferior surface 14 cm. from anterior border. No wound of intestine.	11 hrs.	11 hrs.	Recovery.	Fr. Charleston, Del. by train and ambulance.
7180	Four perforations in jejunum.	26 hrs.	26 hrs.	Recovery.	Fr. west'n part of State.
7572	Wound about 1.5 cm. long and 1 cm. wide in left flank region, 2 or 3 cm. above a. s. l. s. Bullet about one-half inch under skin.	4 $\frac{1}{2}$ hrs.	5 days.	Recovery.	
8705	Shot at Cumberland and operated on there. Came here 2 $\frac{1}{2}$ months later. A portion of cartilage of 7th rib resected. Cartilage removed and bullet and some bits of clothing found. Hernia followed.	2 $\frac{1}{2}$ mos.	2 $\frac{1}{2}$ mos.	Recovery.	
9072	Wound of entrance 1 $\frac{1}{2}$ cm. in diameter half way between anterior superior spine and costal margin rt. side. Perforation of caecum. Wound of exit in mesenteric border. Haemorrhage and extravasation.	2 hrs.	3 $\frac{1}{2}$ hrs.	Death 1 day after operation.	Br. in patrol.
9087	2 perforations in jejunum; 2 in transverse colon.	7 hrs.	8 hrs.	Recovery.	Fr. Brunswick, Md.

HEINE MARKS, M. D., (Reprint from the Transactions Missouri State Medical Association, 1888.)

1	2	3	4	5	6	7	8
Number of cases of gunshot wound of the abdomen operated by you.	How long after receipt of the injury did you first see the case?	Length of time intervening between receipt of injury and operation.	Extent of wounds. Viscera injured or not. Missile.	Where was operation performed, at hospital or home?	What assistance did you have? Physicians? Nurses, trained or untrained?	Was patient transported before or after operation, and if so, by what means and how far?	Result of operation.
1 Wm. C. Apr. 20, '92	8 hours	8 or 9 hrs.	15 perforations of ileum. .38 calibre bullet (?)	St. Louis City Hospital		Before	Died in 7 days
2 A. W. July 3, '92	2 "	2 or 3 "	7 perforations of the ileum within 2 ft. of cecum. .38 calibre bullet.	"		"	Recovery
3 S. S. July 4	3 "	3 "	2 perforations of ileum. .42 calibre bullet. Pistol.	"		"	"
4 R. B. Aug. 15, '92	4 "	4 or 5 "	2 perforations descending part of duodenum; 1 in mesocolon; 2 of stomach. .38 calibre bullet.	"		"	"
5 E. W. Sept. 7, '92	4 "	4 or 5 "	Penetrated left kidney and spleen 1 hole in intestine. .38 calibre.	"		"	"
6 T. N. Sept. 18, '92	3 "	2 or 3 "	8 perforations, small intestine.	"		"	Death 4 days after
7 I. G. Oct. 2, '92	5 "	5 hrs.	3 holes in jejunum. Calibre .38	"		Walked an hour, transported in wag- gons 4 or 5 miles, then in train. Before.	Recovery
8 M. N. (Oct. 23, '92)	1	1 hr.	16 bullet wounds in ileum, 1 in mesentery, 2 in posterior surface bladder, 1 through uterus, 2 in rectum. 2 holes in jejunum, 1 in mesentery, 1 in stomach. Calibre .38	"		Before	Died in 10 hours
9 J. S. Nov. 21, '92				"		"	Recovery

## HEINE MARKS. (Continued.)

				St. Louis City Hospital			
10	J. S. Nov. 21, '92	1½ hours	1½ to 2 hrs	2 large perforations transverse colon, mesenteric artery bleed- ing. .38 calibre.		Before	Recovery
11	J. G. Dec. 1, '92	Several hours	Several hrs.	1 perforation splenic flexure of colon. Hemorrhage. Cal. .38	"		Recovery
12	P. F. Mar. 2, '93	2 hours	2 or 2½ hrs	2 perforations transverse colon, 1 of liver and gall bladder. Hemorrhage. .38 calibre	"	"	Death in 10 days
13	S. H. Mar. 5, '93	2 or 3 hrs	2 or 3 hrs	2 perforations descending colon Wound of spinal cord. Cal. .38	"	"	Death in 8 days. due to sepsis from bullet in cord.
14	S. C. Apr. 16, '93	2 hours	2 or 2½ hrs	6 perforations of ileum. .38 calibre	"	"	Recovery
15	G. C. Apr. 23, '93	4 hour	4 or 4½ hrs	2 perforations of stomach, 1 of omentum. Spleen wounded. .38 calibre.	"	Walked 12 blocks Before	"
16	J. H. May 9, '93	1 hour	1 or 1½ hrs	1 perforation of stomach. .32 cal.	"	Walked 20 ft. drove in cab. Before	"
17	W. W. May 14, '93	An hour or so	An hour or so	1 perforation of stomach, 1 of liver. .32 calibre.	"	Walked four blocks drove in cab. Before	Recovery (?)

## MORDECAI PRICE, M.D., 1835 Spring Garden St., Philadelphia, Pa.

					Home.	Physicians.	No.	
1	24 hours.	24 hours.	20 cal. pistol shot wound entirely through lower right kidney. Wound of artery. Right kidney removed for hemorrhages. Kid- ney in Army Medical Museum. Recovery.					Recovery.

F. W. McRAE, M.D., Atlanta, Ga.							
1	2	3	4	5	6	7	8
Number of cases of gunshot wound of the abdomen operated by you.	How long after receipt of the injury did you first see the case?	Length of time intervening between receipt of injury and operation.	Extent of wounds. Viscera injured or not. Missile.	Where was operation performed at hospital or home?	What assistance did you have? Nurses, trained or untrained?	Was patient transported before or after operation, and if so, by what means and how far?	Result of operation.
1	4 hours	4 hours	Two perforations of small intestines and of mesentery. Pistol ball, 38 calibre.	Early Hospital	3 hospital internes, 1 trained nurse, and 1 pupil-nurse.	Before. By hospital ambulance, within 2 miles (?)	Cured
2	1½ hours	1½ hours	3 perforations of stomach, pistol ball, 32 calibre	"	"	"	Cured. Ball vomited short while before operation.
3	3½ hours	3½ hours	Entered back, came out 1½" before ensiform cartilage, ball passed the pancreas, hemorrhage from behind same profuse. Pistol ball, (?) calibre.	"	" and Dr. W. P. Nicholson	"	Died 37 hours after operation.
JOHN C. SEXTON, M.D., Rushville, Indiana.							
1	12 hours.	15 hours.	6 perforations, 38 cal. bul.	Home.	2 physicians.	No.	Recovery.

A. VANDER VEER, M.D., Albany, N. Y., Dec. 26, 1901.

I wish to say to you that I fully appreciate all your ideas, especially when I take into consideration your experience during the Civil War. As I look back now I think of many a fellow that might possibly have pulled through had we given him the benefit of an immediate operation. I believe a reasonably well equipped field hospital would admit of all such cases being examined.

H. G. MUDD, M.D., St. Louis, Mo.

	2 hours	4 hours	Two perforations of small intestine .22 calibre bullet.	At home	Physicians	Before. ½ milie.	Perhaps ½	Recovered
1 J. McS.								
2 A. Z.	5 "	6 "	Perforation colon ascending. .44 calibre bullet.	"	Physicians	Before. blocks	A few city	Recovered
3 E. M.	½ "	1½ "	Six perforations of ileum. .22 calibre ball.	"	Physicians	Before. block.	About 2 city	Recovered
4 W. K.	4½ "	5½ "	Hepatic flexure of colon, two perforations. Liver perforated. .22 calibre.	At hospital	Physicians and trained nurses.	Before. About 7 milies	About 7 milies	Recovered
5 J. L. D.	14 "	15 "	Two perforations of stomach, large perforating wound of jejunum. .32 calibre bullet.	At home	Physicians	Before. milie.	Perhaps ½	Died
6 F. G.	8 "	9 "	Three large ragged perforating wounds of duodenum and upper part of jejunum. .38 cal. ball	At hospital	Physicians and trained nurses.	Before. 25 milies.	25 milies.	Died
7 O. K.	2 "	4 "	Perforation of stomach and oesophagus.	At hospital	Physicians and trained nurses.	Before. ½ milie	½ milie	Died

MAJOR GEORGE TULLY VAUGHAN, in Proc. of the Ass'n of Mil. Sgs. of the U.S. Vol. IX, 1840, page 244 et seq.

1 S. D. Mar. 5, '98.		28 hrs.	Diaphragm, liver, colon, kidney. Pistol 32 <sup>r</sup> cal.					Recovery.
2 G. A. F. May 24, '98.	45 min.	About 1 hr	8 perforations in lower part, jejunum 2 perforations in ileum. 12 perforations of mesentery. Pistol 41 <sup>r</sup> cal.	Hospital.				Recovery.
3 J. L. Dec. 12, '98.	2½ hours.	3 or 4 hrs.	5 perforations in small intestines. 2 perforations in stomach. 2 perforations of intestine. Pistol, 41 <sup>r</sup> cal.	Hospital.		(1 kidney was cystic) Walked to hosp. bef. operation.		Death.

ROSWELL PARK, M.D., Buffalo, N. Y.							
1	2	3	4	5	6	7	8
Number of cases of gunshot wound of the abdomen operated by you.	How long after receipt of the injury did you first see the case?	Length of time intervening between receipt of injury and operation.	Extent of wounds. Viscera injured or not. Missile.	Where was operation performed, at hospital or home?	What assistance did you have? Physicians? Nurses? Trained or untrained?	Was patient transported before or after operation, and if so, by what means and how far?	Result of operation.
1	3 hours.	8 hours.	Multiple lacerations and punctures of intestines, perf. of liver .45 bullet at 10 feet.	U.S. Post hospital	Physicians and U.S.A. orderlies	Carried short distance.	Death from collapse 12 hours. Sutures tight.
2	2 hours.	6 hours.	4 perforations of small intestines, 2 of mesentery. .32 bullet.	Home.	Physicians	Carried home a few blocks.	Death 4th day. No periton. Acute pericarditis.
3	8 hours.	8 hours.	2 perf. of stomach. .32 bullet.	Hospital.	Hospital Staff	By cars and ambulance 40 miles	Recovery.
4	4 hours.	5 hours.	Multiple perf. of small intestines. .32 bullet.	Hospital.	"	About 6 miles ambulance.	Death 32d day. No autopsy.
5	8 hours.	3½ hours.	4 bullets fired into belly. 3 openings of exit. No perf.	Hospital.	"	About 2 miles ambulance.	Recovery.
6	6 hours.	7 hours.	2 perforations of stomach. .32 bullet.	Hospital.	"	2 or 3 miles ambulance.	Recovery.
J. D. McHILL, M.D., reported in N. Y. Med. Jour. Sept. 28d, 1899, pages 451 and 2, by J. N. Le Conte, M.D.							
1	About 40 minutes.	2 hours.	1 hole 2½" from pylorus, 1" below lesser curvature in anterior wall of stomach. Pistol.	Jersey City Hosp.	Not stated. Presumably both.	Before.	Recovery.



## MAKINS' SURGICAL EXPERIENCES IN SOUTH AFRICA, 1901.

164	40 hours.	3 days.	Liver turned, stomach slit at les. in a house and ser curvature. Mauser bullet.	Wounded at Enslin. Before.	Death 12 days after operation.
165	8 days	4 days.	Open fracture of fibula, 3 perforations in jejunum, Lee-Metford.	By hand and on train. Before. Wounded at Graspan.	Death 17 hours after operation.
166	4 days.	4 days.	2 perforations of ileum. Mauser bullet. Military hospital. Stationary.	Wounded at Magersfontein. Before.	Death 12 hours after operation.
169	4 days.	4 days.	2 slits through peritoneal and muscular coats of jejunum, oval patches of ecchymoses on other coils. Mauser bullet. Military hospital. Stationary.	Wounded at Magersfontein. Before.	Death day after operation.
180	50 hours.	53½ hours.	Rent of colon. Lee-Metford bullet. Military hospital. Stationary.	Before. From battle-field to field hospital, thence 25 miles by train.	Death 8 days after operation.
181	3 days.	4 days.	Perforation of (large?) Intestine. Military hospital. Stationary. Mauser bullet.	Before. Miles in ambulance. Train.	Recovery.

The table on page 47 shows 30 cases of intestinal injury. 15 of these were possible injuries with no mortality and 15 certainly diagnosed cases with a mortality of 10 or 66½ per cent. Of these certainly diagnosed cases there were 8 operated upon with a mortality of 5, or 62½ per cent. as against a mortality of 5 or 55½ per cent. in the 9 certainly diagnosed cases not operated upon. This would appear to indicate that operation after 2 days is apt to be attended with fatal results. These statistics are unnecessary to demonstrate this fact as it is commonly believed that these cases must receive immediate operation, (certainly within 12 hours) if they are to be benefitted thereby.

Mr. Makins states, page 458 "I am unaware to what degree success followed intestinal operations generally during the campaign. I saw only one case in which the small intestine had been treated by excision and the insertion of a Murphy button in which a cure followed. This case was brought into the Scottish Royal Red Cross hospital under the care of Mr. Løke. I heard of 2 cases in which the large intestine was successfully sutured and of one other in which recovery followed the removal of a considerable length of the small bowel from multiple wounds.

Some of the difficulties in the way of operating upon these cases, mentioned by Mr. Makins are cold, darkness and lack of water. (Case 168 was brought into the field hospital at 9 p. m., when the temperature of the tent was below 26° F. and continuous fighting precluded operation the next day.

From a study of the cases reported by Mr. Makins it is apparent that to treat these cases properly the operator must be certainly not less than twelve hours from where the men are wounded and that he must have heat, light and water with him.

RICHARD DOUGLAS, M. D., Nashville, Tenn., from A. M. A. March 18, 1899, page 582 et al.

1	2	3	4	5	6	7	8
Number of cases of gunshot wound of the abdomen operated by you.	How long after receipt of the injury did you first see the case?	Length of time intervening between receipt of injury and operation.	Extent of wounds. Viscera injured or not. Missile.	Where was operation performed, at hospital or home?	What assistance did you have? Physicians? Nurses, trained or untrained?	Was patient transported before or after operation, and if so by what means and how far?	Result of operation.
1 Sep. 21, '98	3 hours		Hand l. ankle joint 2. of abdomen. 4 perforations of small intestines. Abdominal wounds in l. lumbar and ing. region.	Nashville City Hospital.	Two physicians. Nurses. (?)	Before.	Death 14 days after operation.
2 Dec. 11, '98	1 hour		2 perforations transverse colon and of omentum. g s w tip of 10th l. rib.	"	"	"	Recovery
3 Dec. 25, '98 2 hours	2 hours		4 intestinal perforations, hemorrhage from large vein. Pistol .38 wound in r. ing. region.	"	"	"	"
4 Dec. 25, '98 10 minutes 2 hours			6 perforations small intestines, hemorrhage from perforation of intestines. Small bullet wound tip of 10th l. rib.	"	"	"	"
5 Dec. 26, '98 2 1/4 hours	2 hr. 45 m.		5 1/2" of small intestine destroyed, resected Murphy button. Toy cannon charged with powder, rags and paper. Range 4 ft. Wound in r. ing. region.	"	"	"	"

It must be admitted that in military practice, facilities are not at hand, and this is the only justification of an inactive course.

M. STUTTON, M.D., Peoria, Ill., in Jour. of A. M. S., Dec. 30, 1899, pages 1611 and 1642.

Mrs. I. Sept. 1, '99.	A short time.	A short time.	Bullet entered peritoneal cavity and wounded diaphragm. Pistol 32" cal.	Hospital.	Physicians, prob- ably nurses.	To hospital in ambu- lance.	Recovery.
1 J. B. Oct. 4, '91	8 hours.		11 perforations of small intestine. Pistol 38" cal. Shot twice.	Hospital.	Presumably both physicians and nurses.	Before, to hospital.	Death 48 hours af- ter operation.
2 W. McC. Dec. 21, '95	Few min.		16 perforations of small intestine. Pistol 33" or 38" cal. Shot twice.	Hospital.	" "	" "	Recovery.
3 A. K. Dec. 5, '98	Few min.		2 perforations in ascending colon, 2 in transverse and 2 in stomach.	Hospital.	" "	" "	Recovery.

GEORGE WOOLSEY, M.D., N. Y. Med. Jour. July 8, 1899.

NO SIGNATURE, Denver, Col., Dec. 7, 1901.

1	2 hours.	2½ hours.	13 wounds of intestine and mesen- tery, suture and resection.	Hospital.	My assistant and Trained nurses.	By ambulance 2 miles to hospital.	Death 28 hours.
---	----------	-----------	--	-----------	-------------------------------------	--------------------------------------	-----------------

Mr. WATSON (HEYNE, Quoted in Makins' Surgical Experiences in South Africa.

1 (Case X.)	24 to 30 hrs.	1-2 days.	Two perforations of ascending colon.	Military Hospital Karree.		Wounded at Karree. Sliding Mar. 20. Be- fore.	Death April 2d.
-------------	---------------	-----------	--------------------------------------	------------------------------	--	---	-----------------

13 cases of probably perforating g. s. w. of the abd. occurred in this battle (Karree Sliding March 20). 5 died before Mr. Heyne saw them. 5 died unoperated upon and 1 (Case X) died after operation. Of the remaining 4, case V possible perforation of stomach, was "going on well" April 1st. (Case VI had a temperature of 101 April 1st, but his condition was good. The general condition of case VIII was good April 1st, but he was still in much pain. Case IX was "very well" April 1st, and it was considered very doubtful if any viscus was wounded.

The following answers to questions 9, 10 and 11 were received:

9. Is it your opinion that these cases should, as a rule, receive immediate operation or should only those cases in which visceral lesion is certain, be operated upon?

Yes, the rule should be to operate immediately. The diagnosis of visceral lesion is uncertain. All such operations are necessarily exploratory.

J. H. CARSTENS, Detroit, Michigan.

All cases should have benefit of immediate operation. One can be sure of visceral cases in only a small percentage of cases even when they are extensive.

F. W. MCRAE, Atlanta, Ga.

My opinion is that these cases should, as a rule, receive immediate operation and not wait to make certain that visceral lesion is present. Operation should be done where we can determine that the abdominal cavity has been perforated.

HARVEY G. MUDD, St. Louis, Mo.

They should all have immediate operation.

J. B. MURPHY, Chicago, Ill.

All cases.

ROSWELL PARK, Buffalo, N. Y.

Operate on all cases as soon as possible.

JOHN C. SEXTON, Rushville, Indiana.

I believe in immediate operation as a rule.

No signature, Denver, Colorado.

10. If intestinal perforation has occurred and transportation is necessary do you believe the patient will stand the best chance of recovery if operated upon before or after the operation?

Before transportation; in some cases after transportation. See details in letter.

J. H. CARSTENS, Detroit, Mich.

I am sure the danger of transportation would be materially lessened by proper surgery.

F. W. MCRAE, Atlanta, Ga.

I think that each individual case should have individual consideration in regard to the matter of transportation. The conveniences for operation, assistants, etc., must all be considered before determining upon operation, immediately or after transportation, and decision in this matter must depend on the best judgment of the surgeon at the time.

HARVEY G. MUDD, St. Louis, Mo.

Before transportation.

J. B. MURPHY, Chicago, Ill.

Usually after transportation.

ROSWELL PARK, Buffalo, N. Y.

Would advise against moving if possible.

J. C. SEXTON, Rushville, Indiana.

Before transportation.

A. VANDER VEER, Albany, N. Y.

Before transportation.

No signature, Denver, Colorado.

11. If you consider it is proper to delay operating in these cases until primary shock has been recovered from or a certain diagnosis as a visceral injury is made, what length of delay is consistent with the interests of the patient?

It depends on the degree of primary shock. As a rule, yes. Absolute diagnosis impossible and no fixed time for delay. If hemorrhage, absolutely no delay, no transportation, immediate operation; if no hemorrhage, delay of six, twelve, or even twenty-four hours can be permitted.

J. H. CARSTENS, Detroit, Mich.

I do not approve of delay. I do not think the simple tracing of a wound or careful exploration dangerous.

F. W. MCRAE, Atlanta, Ga.

I think the best interests of the patients are served by the earliest operation possible consistent with good circumstances and surroundings for operation.

HARVEY G. MUDD, St. Louis, Mo.

If they are not operated at once and perforation has taken place the manifestation of infection would as a rule only precede the fatal termination.

J. B. MURPHY, Chicago, Ill.

Delay inadvisable.

ROSWELL PARK, Buffalo, N. Y.

Operate at once or not at all.

J. C. SEXTON, Rushville, Indiana.

I would not wait longer than twelve hours for primary shock to pass.

A. VANDER VEER, Albany, N. Y.

Only sufficient delay to overcome shock.

No signature, Denver, Colorado.

The following additional remarks were also received :

Your request for information in regard to gunshot wounds of the abdomen is duly received. I enclose a report of my two most interesting cases. These are the only ones that I have complete record of, as during my earlier years I did not take full notes of my cases. [See tabular statement page 267 for report of cases.]

\* \* \* \* \*

Where the patient is within reasonable reach of a hospital and it is a question of operating upon him with poor surroundings at his own home or with the best of surroundings at the hospital I would advise transportation, but each case must be determined for itself.

Whether these abdominal wounds should be operated upon amid the hurry and confusion incident to a surgeon's work fol-

lowing a battle is a question that I am not at all competent to decide. Army surgeons, when they have entered the army through the usual channels, are usually thoroughly competent men and are well equipped for any work. \* \* \* \*

In civil life, however, and in a thickly settled country a competent surgeon can usually be obtained within six hours, and such a surgeon with his assistants and trained nurses can certainly give a patient a much better chance for life than he would have if no intervention were made. We should not overlook, moreover, the difference between the wounds inflicted by the bullets which we meet with in civil practice and those which military surgeons of the present day deal with. The difference in missiles is so great and the results without operation so different that I think the true problems will have to be settled without regard to each other, and it will be a question merely of statistics to know whether it is wise to operate in military practice or not.

J. F. BALDWIN.

Although I have performed two thousand or more abdominal sections, I never had a case of gunshot wound or stab of the abdomen. It is very peculiar for I have operated on every kind of case and on every abdominal viscera. But the people in Detroit, you know, are peaceful and they do not shoot so much as they do down South or out West and, as I have not been in the war, you can readily see how it is brought about.

However, your stand on the question I decidedly endorse, as I believe in thoroughness and not guessing at it. At the same time, my dear Doctor, we may go to extremes and operate where the environments are poor and the surgeon without experience.

In last week's Journal of the American Medical Association, you may see my plea for better surgeons and better preparation of the surgeons. In your article you insist and assume that surgeons should be prepared to do those operations. Every one will agree with you, *but they are not*, and I hold that the man who has had no experience in abdominal surgery has no business to perform it. If I had a gunshot wound of the abdomen, I would rather trust to the *vis medicatrix naturae* than an inexperienced surgeon and I would rather wait twenty-four hours until a surgeon with experience could be had.

You take a young surgeon who has been in a hospital where a great deal of abdominal surgery is done and who has assisted at a hundred or more such operations, such a young surgeon, I would trust, but he must have actually assisted, not looked on from a distance.

Hence, if you will insist that *all the surgeons in the army should have had such experience before they enter the service*, then you will have men who are probably capable of performing an abdominal section and then the operations should be performed as quick as possible.

But if such men are not on the battlefield, then persons wounded in the abdomen should be transported to the rear, to a hospital properly equipped and where surgeons with some experience can perform the operation, even if it should take six, twelve or even twenty-four hours after receiving the injury.

You will have noticed that Senn, in this country, judging from the Spanish-American war, and Treves, of London, judging from the South African war, are inclined to think that the "let alone" policy is the best and you will get into a great controversy if you insist too strongly on that point. Of course that doesn't phase me, and I am sure it doesn't you either.

At the same time, the opening of the abdomen is a very serious operation indeed. Many cases have died as the result of simply opening it from the infection carried by the surgeon and his assistants into the abdominal cavity and it takes quite a brilliant operator and one constantly alert to keep everything reasonably aseptic, and on the battlefield that can hardly be expected. It can be done five or ten miles in the rear and that is where the operation should be performed, it seems to me.

J. H. CARSTENS.

Although I formerly did much work regarding the medico-legal bearings of gunshot wounds I have not cared for them since the days of abdominal surgery.

I commend your position heartily,

J. N. HALL (Denver, Colorado.)

I am in receipt of yours of the 3rd. inst. and in reply beg to forward, under separate cover, reprints which I have, same being

a partial list of clinical histories of cases operated upon during my four years at the St. Louis City Hospital. I then advocated salt solution for flushing out the abdominal cavity, but I have found since it exaggerated conditions, causing increased peristaltic action, and at times caused intussusception of the intestines; and also frequently distributing the escaped fecal matter throughout the entire peritoneal cavity. I now use nothing but dry, sterilized sponges carefully prepared, and find that I obtain better results, a greater percentage of recoveries.

I have operated upon 75 cases of penetrating gunshot wounds of the hollow viscera and fully agree that immediate operation is almost always best and less liable to complications. When I am satisfied that the viscera have been perforated, or when in doubt, I deem it justifiable to perform an explorative operation, made under aseptic conditions, providing it can be had,—this giving the patient a chance for his life. I have discarded, long ago, the gas and probe methods of making a diagnosis. Nearly all cases operated upon while in the St. Louis City Hospital were from two to six hours after the injury, due principally to our system of conveying patients, first to the City Dispensary, where an examination was made, then by the ambulance route to the hospital, this consuming time. And I assure you that the patients always had a pretty rough ride of it.

The building in which the operating room was located was over 50 years old, crowded at all times with indigent poor and under conditions that were not the best.

HEINE MARKS.

While I have operated in civil practice for gunshot injury of the abdomen I have never done so in military practice, hence I prefer to write you a letter rather than not answer your blank. I am both theoretically and from practical acquaintance with military surgery opposed to operating in the field, except under circumstances that are altogether too exceptional to be considered. My abdominal operations far exceed in numbers any other class of the thousands dealt with in my practice of the last 33 years, and my experience also comprises considerable experimental work. Moreover, from having taught for years how to



secure asepsis under adverse circumstances and having had to attempt to secure it under fire, I cannot be considered to belong to either of the classes you contend comprise all who oppose you. Sir Wm. MacCormac, whom I know well, who had most extensive experience in the Franco-Prussian war and in South Africa, Treves, one of the leading abdominal surgeons of the world, and others of great experience in both civil and military practice, take the same position that I do, viz., unless operated within a few hours it is too late, and when it is not too late facilities in the way of asepsis and skill are not obtainable. Having dressed wounded under fire, I know whereof I speak.

C. B. NANCREDE.

[The point of early operation is well taken, Lack of skill can certainly not be pleaded in the case of Major Nancrede.]

I believe in the immediate operative treatment of gunshot wounds of the abdomen in all cases where hemorrhage or fatal lesions of the gastro-intestinal tract dictate such a course.

N. SENN.

There is no way to determine the absence or existence of intestinal injury absolutely except by exploration.

Cases have been reported in which even as late as six hours after sustaining a penetrating injury of the abdomen there were no symptoms whatever, but operative explorations showed extensive injury.

One St. Louis case is reported where there was neither pain, shock, tenderness, temperature, tympanites, irregular pulse, or rapid breathing as late as six hours after injury, and yet operation revealed eight perforations in the ileum and two and one-half inches of the bowel had to be resected.

I modestly submit that the danger resulting from exploration, as it can be conducted even in an ordinary farm house, is sufficiently small to warrant the incision in all cases. A delay of a few hours may mean death from hemorrhage, as in the following case where a boy of twelve years was shot with a .22 caliber rifle. The patient died at the end of twenty-four hours. The ball had only passed through the abdominal wall, made a small tear of the mesentery close to the bowel and was found in the

adjacent fat, but a small artery not much larger than a hair had been cut and the boy bled to death into the abdominal cavity.

In cases without hemorrhage it is unsafe to rely upon the forces of nature, for the protruding mucous membrane, while it may for a time successfully prevent escape of intestinal contents, offers little hope of perfect closure and delays the process of repair.

A post-mortem in one case in which peritonitis had caused death on the seventh day after injury, showed the mucous membrane prolapsed and the perforations plugged, but so inflamed as to suggest a causative factor in the inflammation. On account of so many failures many surgeons are opposed to operations in these cases. While I am willing to admit that seventeen operations with only two successes does not make a very bright record, I am unable so far to trace only a single case in Indiana in which there is any evidence of visceral injury that has recovered under expectant treatment.

One or two cases have claimed to have recovered after perforation wound of the stomach, but the histories are lacking in diagnostic evidence. Operation gives undoubtedly the most hopeful outlook in such injury.

The first forty-three cases ever done in the world, collected by Carson, of St. Louis, have thirteen recoveries, whereas if you leave the patients alone or treat them expectantly, you will be convinced of the truth of Abernethy's remark, that "Nature would have nothing to do with these cases, but stood by and shook her head and left the patient to his hopeless fate." [For tabular statement of case see page 272.]

JOHN C. SEXTON, M. D., Rushville, Ind.

The subject of gunshot wounds of the intestines is one which I have watched from its dawn until the present time. It was my good fortune to be present in New York city when the late Dr. J. Marion Sims, who had just returned from his experience in the Franco-Prussian war, reported to the New York Academy of Medicine the cases of gunshot wounds of the abdomen he had seen on the battlefield of Sedan and other engagements. He took the advanced position that the only method to pursue was to expose

such wounds, clean out the peritoneal cavity, close the openings in the intestines, and drain when necessary. He based this conclusion on his observation of a series of cases that recovered, the only cases recovering having been shot through the pelvis, in which the bullet passed through and through, thus allowing drainage. This demonstrated to him that drainage was in the present stage of surgical science the essential feature of treatment. His position was strongly opposed by such distinguished surgeons as James R. Wood and Lewis A. Sayre, and in reply Dr. Sims said that he and they might not live to see it, but their children would see the day when every gunshot wound of the abdominal cavity would be exposed by incision, the wounds sewed up and drainage secured.

Careful antisepsis has made it in many instances unnecessary to establish drainage, but the broad principles which Sims insisted upon then are now fully accepted.

In the case reported by Dr. Sexton, success was due to prompt interference and good surgery. The sooner we learn to insist upon operating all these cases at once, regardless of shock, when we are convinced that shock is due to hemorrhage, the better success we will have, and when there has been severe hemorrhage the intravenous injection of salt solution should be done just before or coincident with the operation.

JOHN A. WYETH.

In an extract from Dennis' System of Surgery, in the section on Military Surgery by General William H. Forwood, Surgeon General, Retired, U.S.A., we find the following:

'Laparotomy for gunshot wounds of the abdominal viscera, unlike many other operations in military surgery, will always be greatly restricted in its application and usefulness by the very exacting conditions necessary to success. Wounds of the viscera do not admit of delay. There is no way to prevent sepsis, as in external wounds. The time that may elapse before an operation must be done is limited to from three to five hours, after which the chances of success diminish very rapidly. The operation must be done at the hospital in a warm, quiet room protected from wind and dust, with good light, competent assistants, plenty of

time, and the advantage of the strictest antiseptic precautions. Very exceptional qualifications are demanded of the surgeon. None but those having skill and especial training in this line, and who have had considerable experience, at least on the cadaver and on living animals, should dare undertake it. The mortality from laparotomy for gunshot wounds of the intestines done by inexperienced operators will be much greater than that under the expectant plan of treatment. Except in siege operations the hospitals will rarely be established in time to offer the benefits of this operation to those wounded in the early part of the engagement. Very few of the severely wounded will be able to reach the hospital under ordinary circumstances, within five hours after the receipt of their injuries. Men with penetrating wounds of the abdomen suffer from shock and hemorrhage, and often have to remain for a time on the field, and they usually have to be carried long distances on litters. Such cases are brought to the hospital in the evening or during the night, when the difficulty of operation is increased by the want of proper light, or more frequently not until the following day, when it is too late. An operator with the requisite skill and experience will rarely be available, and where there are many wounded the services of two or three of the best surgeons and an hour or two of precious time can seldom be given to the doubtful benefit of one among a number of men urgently needing assistance. Battles result in defeat just as often as in victory for one side or the other, and among the wounded prisoners the benefit of laparotomy will hardly be realized, although some ante-mortem abdominal sections may be made by well-meaning surgeons with more zeal than discretion. On the whole, the outlook for future operative interference in cases of penetrating wounds of the viscera on the battlefield is not very promising. But still, there will be exceptional cases and especially favorable circumstances where this procedure may become practicable.

“After every great battle all the more severely wounded ought to remain and be taken care of as near as possible to where their wounds were received. Instead of being moved from place to place and hauled about on railroad-cars and steamboats for ten days or

two weeks to hospitals in the cities already crowded and infected with diseased wounds, tents and temporary hospital accommodations should be promptly brought to the wounded, and they should be left at rest and permanent treatment begun at once. They should be turned over to volunteer aid societies in order to relieve the military surgeons—who must go on with the army—and the best surgeons from civil life should come to attend them. The twenty-one thousand wounded after Gettysburg, and those from other great battles during the War of the Rebellion, included many serious cases that certainly would have done better if they had been treated in tents pitched on frames near the field, where they could have remained for a time, instead of being moved at once to the general hospitals."

It will be noted that General Forwood insists on the necessity for immediate operation—"Wounds of the viscera do not admit of delay." He also protests against all needless transportation of the wounded. Let us strive to overcome the difficulties noted by General Forwood as greatly restricting this operation. Let us endeavor to establish our hospitals in time for these emergencies. We, more and more as the science and art of surgery and its teaching advance have a right to expect to find operators with the requisite skill and experience on the spot to care for these wounded. If these surgeons can be secured after the battle they can and should be secured before and in time to treat these cases.

Major William C. Borden, Surgeon, U.S.A., "Edro," in his Sander prize essay on Military Surgery, 1900, says "In considering the statistics of the Spanish-American War, the factor of treatment should be taken into account.

"Penetrating wounds of the abdomen (U.S. Regulars), 44.

"Laparotomies for these wounds, 4; mortality, 100%.

"Cases not operated on, 40; deaths, 25; mortality, 62.5%"

From the records of the Surgeon General's Office cited on page 261, it will be noted that

Case 1 was operated on in 2nd Division Hospital, 7th A. C., Havana, by Major George Ryerson Fowler, Chief Surgeon, U.S.V., as per personal letter from Major Brown.

Case 2 was operated upon at Fort Huachuca, A. T., by Major Gray, Surgeon, U.S.A., that in

Case 3 a bullet was extracted and the patient recovered, and in

Case 4 a bullet may have been extracted but the patient died subsequently of typhoid fever.

On page 314 of the Report of the Surgeon General of the Army to the Secretary of War for the fiscal year ending June 30, 1899, the following is noted :

"Of 20 nonpenetrating wounds of the abdomen none was fatal, the death recorded in the table having been due to malarial fever. Of 44 penetrating wounds 30 died and 1 was dropped as missing; 5 were discharged on certificates of disability. The rate of mortality among these cases was 68.2 per cent. Surgical intervention is mentioned in only four of these cases. The bullet was removed in two cases, one fatal; in one, laparotomy was performed with a fatal result, and in one a wound in the colon was closed, the patient dying of septic peritonitis, January 23, 1899. The immediate cause of death is stated in four cases—in one septicemia, in one septic peritonitis, in one acute peritonitis, and in one internal hemorrhage, October 11, 1898, from a wound received July 1, 1898."

These statistics do not bear upon the question of immediate operation in penetrating gunshot wounds of the abdomen in war unless possibly Case 1 was an immediate operation. I have been unable to hear from Major Fowler, who is now out of the service. In any case, as before stated "this operation was performed in a stationary hospital."

Major Borden continues: "To summarize, it may be concluded that modern surgical methods have not as yet proved available to markedly reduce the mortality of the wounded in penetrating wounds of the abdomen received in war; but, that the mortality in these cases has been lowered to some extent by the use of the small-caliber rifle."

I wish to urge that modern surgical methods be applied to these cases. Until that is done these methods will not have any effect whatever on the mortality. It should be noted that the

rate of mortality, 62.5%, among the 40 cases of penetrating wounds of the abdomen not operated upon can not be used for purposes of comparison with cases operated upon. The diagnostic measures available in these fourteen cases reported as penetrating gunshot wounds of the abdomen and recovery without operation were, in the light of our present knowledge, inadequate to demonstrate that these were cases in which the abdomen was penetrated.

In A Report of Gunshot Cases in the Spanish-American War, and Deductions Therefrom (N. Y. Medical Journal, March 31, 1900, page 450) Major Borden states he saw and treated five cases of gunshot wound of the abdominal parietes and one of the abdominal cavity. The latter case was seen two days after receipt of injury and was not operated upon. "The records of the Naval Hospital show that this man suffered at intervals from nervous and bilious attacks and was invalided from the service July 28". Wounded May 11th.

He states that "laparotomy for gunshot wounds, in order to be effective has to be done within a very short time after the receipt of the injury.

"Previous to the experience gathered in this war, many writers, arguing from the standpoint of laparotomy in civil hospitals where there are all appliances necessary to asepsis, held that laparotomy for gunshot wounds would become a recognized principle in military surgery. The attempt to carry out this principle was disastrous, and as several cases of abdominal wounds recovered under the expectant treatment, it may now be considered as settled that laparotomy should only be resorted to in those cases in which the surgeon is sure that death will occur without it." (N. Y. Medical Journal April 7, 1900, page 503.)

If it is "considered as settled that laparotomy should only be resorted to in those cases in which the surgeon is sure that death will occur without it," this operation will seldom be done and the unfortunates on whom it is performed will probably die.

Immediate exploration of abdominal wounds is the only available diagnostic method on which to base treatment. If the wound is found to be penetrating, penetrating the abdominal

cavity, immediate operation is demanded. If we wait to assure ourselves that the case is going to die without operation the operation will be delayed so long as to be of doubtful utility.

An important point that should not be overlooked in this connection is that the modern method of immediate celiotomy in penetrating gunshot wounds of the abdomen which should be applied to military surgery contemplates immediate exploration of all gunshot wounds of the abdomen suspected of being penetrating and of *opening the abdomen only in those cases in which the missile has penetrated*. No great amount of time is necessary for exploration in non-penetrating cases suspected of being penetrating and when this exploration is made it will undoubtedly be found that many of the suspected cases, cases that are now reported as penetrating and recovering without operation, will be found to be non-penetrating.

In a clinical lecture on Penetrating Gunshot Wounds of the Abdomen, Colonel Robert G. LeConte, M. D., of Philadelphia states (American Journal of the Medical Sciences, December 1901, page 717) "Penetrating abdominal wounds made by a lead bullet I believe are as fatal today as ever they were, whenever expectant treatment is pursued; but military statistics of field operations show that the wounds inflicted by the modern weapon have proved much less fatal under expectant treatment than when operation has been undertaken."

In recapitulation he states:

"1. Remove the patient at once to the nearest place where a clean operation may be undertaken.

"2. Assure yourself positively that penetration has taken place.

"3. Having demonstrated this fact, always open the abdomen and search for injuries, and make this search systematic.

"4. Never wait for symptoms to tell you that profuse hemorrhage or intestinal perforation has taken place, for by that time operation will usually be useless."

Inquiry into the subject warrants the conclusion that the statement, "the statistics of field operations show that the wounds inflicted by the modern weapon have proved much less



fatal under expectant treatment than when operation has been undertaken" can be used with equal force to show that the expectant treatment is also best in stationary military hospitals and even in civil hospitals which is a *reductio ad absurdum*. The rules of Dr. LeConte in his recapitulation apply to military surgeons and to military surgery as well as to civil surgeons and surgery.

"4.—Never wait for symptoms to tell you that profuse hemorrhage or intestinal perforation has taken place, for by that time operation will usually be useless."

This proposition should not be the *pons asinorum* of military surgeons. It is sound doctrine and should be thoroughly understood.

Colonel Nicholas Senn in *Recent Experiences in Military Surgery after the Battle of Santiago*, Journal American Medical Association November 19, 1898, page 1240, gives the following:

"GUNSHOT WOUNDS OF THE ABDOMEN.—Our recent experience in Cuba has more than ever confirmed my conviction that not infrequently cases of penetrating gunshot wounds of the abdomen will recover without active surgical interference. For years I have maintained, as the result of clinical experience and experiments on the cadaver, that a bullet may pass through the abdomen on a level and above the umbilicus in an antero-posterior direction without producing visceral injuries demanding operative intervention. Elsewhere the results of my experience and experimentation concerning such injuries have been published. If the bullet traverses the small intestine area it is more than probable that from one to fourteen perforations will be found.

"Four laparotomies for perforating gunshot wounds of the abdomen were performed in the First Division Hospital, the only ones, to my knowledge, during the Cuban Campaign. All of the patients died. This unfavorable experience should not deter surgeons from performing the operation in the future in cases in which from the course of the bullet it is reasonable to assume that this bullet has made visceral injuries which would be sure to destroy life without surgical interference. In other cases the employment of diagnostic tests for the purpose of demonstrating

the existence or absence of intestinal perforations will enable the surgeon to decide what course to pursue. Abdominal section is always justifiable in cases of internal hemorrhage sufficient in amount to threaten life.

"A number of cases of gunshot wounds of the abdomen have been related in connection with gunshot injuries of the neck and chest, in which the cavity of the chest and abdomen and their contents were implicated at the same time, and which are on the way to recovery without laparotomy having been performed. I have seen a number of cases of perforating wounds of the abdomen in the First and Third Division Hospitals that were on a fair way to recovery without operation before they were sent home on transport ships. In most of these instances the bullet wounds were either in the umbilical region or one of the iliac fossae. The following case presents features of more than usual clinical and surgical interest:

"Case 22.—J. F. Taylor, Co. D 10th Cavalry, was wounded July 2. At the time the injury was received he was in the ventral prone position. The bullet entered the left shoulder in the infrapinnatus fossa one inch below the spinous process of the scapula, and passed downward and inward and lodged under the skin in the median line, two inches above the umbilicus. Hemoptysis considerable during the first day, when it gradually subsided. He complained of great pain and tenderness in the right side of the abdomen. No vomiting or symptoms of more than a circumscribed peritonitis. An abscess formed in the abdominal wall, which was opened July 20, and the bullet was removed. From this time on the patient improved rapidly."

This case is also reported by Lieutenant Henry S. Greenleaf, Assistant Surgeon, U.S.A., in the *N. Y. Medical Journal*, Vol. 52, No. 8, who states that Private Taylor "was wounded at about 200 yards."

In the Invasion of Porto Rico from a Medical Standpoint Colonel Senn (*Journal American Medical Association*, September 10, 1898, page 596) states: "One of the wounded was operated on by Dr. Parkhill in an ambulance. The abdomen was torn open by a fragment of a shell, the intestines protruded and a re-

section had to be made of a loop for a tearing injury. It was reported that the patient rallied well from the immediate effects of the operation and that hopes were entertained of his recovery."

Acting Hospital Steward Lucius J. Cole, Fort Grant, A.T., June 1901, states to me he, Cole, was present and it is his remembrance that the man died before the arrival of the ambulance and operator.

In the N. Y. Medical Journal, June 15, 1901, page 1035, Dr. Russell S. Fowler states: " \* \* \* On the other hand, if, after thorough examination of the wound, you find the slightest evidence of the peritoneal cavity having been invaded, do not hesitate a moment to make an exploratory laparotomy. Absolutely, no other treatment is permissible."

"How different this law is from the precepts a few years ago. Even now there are many from whose brain the cobwebs have not been swept and who sit beside their patient with the sublimest faith in Nature, waiting for the signs of hemorrhage or of peritonitis. Then the principle of immediate intervention was unthought of. Hesitancy was the watchword of the hour. It was considered folly to enlarge the wound, death to explore the abdomen. Large doses of opium were given and ice was liberally indulged in. Wise precepts for those times perhaps, but hardly applicable now. Do not wait for confirming symptoms; do not wait for peritonitis to develop. This class of cases gives the most brilliant results in surgery if common sense is but followed in their treatment."

In an Address in Surgery before the British Medical Association 69th annual meeting held at Cheltenham, July 30, 1901, Sir William Thompson said of perforating wounds of the abdomen: (Medical News, August 10, 1901.)

"On the whole, considering the difficulty of diagnosis in many instances at the outset, the fact that intestines may be found unwounded, and if wounded may be occluded by natural processes if not interfered with, it seems that in war as we stand at present the man whose abdomen is perforated by a small-bore bullet has a better chance of life without operation than with it, bearing in mind the circumstances on the field under which laparotomy must be performed. That is an opinion which most sur-

geons came to when experience had ripened after the early months of the campaign. Although the judgement may be a little humiliating it is one which must for the present be accepted."

The judgment must be accepted by whom? Not by the surgeons of the United States! If there has been any case of gunshot wound of the abdomen in war whose chance for life may have been taken away by operation I would like to hear of it. I have been unable to learn of such a case. That the difficulties of this operation in war are frequently great we acknowledge but that they are habitually insurmountable I deny.

Chapter 12 of Makins' *Surgical Experiences in South Africa*, 1901, is of much interest in this connection and has no doubt been read by every military surgeon. Although his experiences in South Africa lead him to the conclusion that: "In the face of numerous recoveries in such cases, habitual abdominal exploration is not justified, under the conditions usually prevailing in the field," he explodes many pet theories of the advocates of the let alone policy. He states: A careful consideration of the whole of the cases that I saw leaves me with the firm impression that perforating wounds of the small intestine differ in no way in their results and consequences when produced by small-caliber bullets, from those of every day experience, although when there is reason merely to suspect their presence an exploration is not indicated under circumstances that may add a fresh danger to the patient."

As before stated it is the duty of the military surgeon to secure conditions that will permit an exploration of abdominal wounds and celiotomy in cases of penetrating wounds without adding a fresh danger to these cases. Inability to secure proper after-treatment is no contra-indication because the cases that will not be killed by the after-treatment without operation will not be killed by this after-treatment if subjected to early exploration or operation.

"The openings in the small intestines were not as a rule difficult to find, on account of the ecchymosis which surrounded them."

The consideration of operative technique, other than that having direct bearing alone on military surgery, can hardly be

dealt with in this paper but the advances being made in this line are numerous and radical.

The uncertain suture supposed to include all coats except the mucous has given way, or is rapidly giving way, to a rational through and through suture with knots inside the intestinal canal. In this connection much credit is due F. Gregory Connell of Chicago, (for able paper see *Journal American Medical Association*, October 12, 1901; page 952 etc.)

The number of special instruments for this work attest its difficulty. O'Hara's intestinal forceps (*American Journal of Obstetrics*, July 1900) were a distinct advance on Halsted's intestinal cylinders, and the tenacula of Allis will prove to be epoch making.

In conclusion:

In military surgery as in civil surgery I consider immediate exploration of all gunshot wounds of the abdomen and immediate celiotomy of all cases found to be penetrating demanded as the only rational treatment and the only treatment calculated to reduce the high mortality in abdominal wounds certainly known to be perforating.

No operation and late operation are as direful in their results in military practice as in civil and it remains to military surgeons to furnish suitable operators and suitable conditions for the treatment of these cases.

If civil surgeons can secure a recovery of 66% by immediate operation upon these cases in hospitals, in the homes of the patients and sometimes with unfavorable surroundings, then military surgeons with their sufficient government supplies and trained nurses should see that their general, base, post, and other stationary hospitals are at all times in such condition as to secure equally favorable results. They should prepare all movable hospitals likewise for these emergencies, and if bound to work under unfavorable conditions occasionally they should meet them as do the best civilian surgeons—and frequently save the patient thereby.

Fort Grant, A. T., May 15, 1902.

THE FOURTEENTH INTERNATIONAL MEDICAL CON-  
GRESS AT MADRID, SPAIN.

By BRIGADIER GENERAL JEFFERSON DAVIS GRIFFITH,  
OF KANSAS CITY, MO.

SURGEON GENERAL, RETIRED, OF THE NATIONAL GUARD OF MIS-  
SOURI; DELEGATE TO THE CONGRESS FROM THE ASSOCIATION  
OF MILITARY SURGEONS OF THE UNITED STATES.



ON reaching our hotel, Santa Cruz, under the wing of Mr. Paromeli, we had no fear of not getting good accommodations; at once getting on our fatigue uniforms, sought the dining room at 11 a. m., for breakfast. We were then directed, (not by any one from our own delegation, who should have known something of plans and communicated same) to the National Art Gallery and Museum, where we could register.

Before Spain was located by geographers, before the first stone of the bull ring was laid at Ronda, far in the Orient, the workmen became so confused in the construction of what would have been the most wonderful monument on earth, that all building was discontinued. To say that we found the second Babel on entering the registration room feebly expresses it. The German, English—in fact every dialect known, was being expounded, (not in whispers by any means,) by an immense throng of hurrying Æsculapeans, seven-

tenths of whom could not make themselves intelligible to the "Latin" at the window or behind the counter. Their credentials when presented were at once pushed back, and by a sign of disgust. They understood beyond any doubt that these official papers were not necessary, and that Secretary-General's receipt was wanted. On producing this we received the badge, programme, invitations, etc., etc. We asked for Bureau of Information—there was none; asked for Official Medical Director—there was none; for tickets of admission to the opening exercises—all had been given out to any one who chose to ask, with or without a badge—physician or layman. We would have it understood that we are not complaining, as it was plainly to be seen that the Committee of Arrangements were looking to a pure Latin Congress, as it was rare, during the entire meeting, to hear either German or English, and no interpreters to be found.

Again at the Mass Conference held at the San Carlos Medical College on the morning of the 30th, (in fact this General Conference was held every morning at 9, and not one-tenth of the visiting physicians were aware of it), Lisbon, Portugal, was chosen as the next place of meeting—making another Latin Congress (two in succession! 'tis unfortunate indeed!) and it is to be hoped that this "almost sister city" will profit by the omissions of Madrid. Unfortunately the hotel accommodations were limited in Madrid. What will we do in Lisbon? We hope the Secretary-General will see that some space will be given to the German, English and American. There are but few cities that can comfortably lodge five thousand delegates, especially when you add one-third more for wives and children.

On the afternoon of the 23rd, at 3, the formal opening of the Fourteenth International Medical Congress, by King Alfonso XIII, took place at the Royal Theatre in the presence of the entire Royal family, and one of the most magnificent audiences of more than ten thousand, made resplendent by the beauty of dressing, flowers, flags and jewelry. As the King entered the Royal box, the magnificent band struck up the Royal March and at once the entire audience rose to their feet. Alfonso was dressed in the Field Marshal's uniform. Everyone else was in

full dress (military or civilian). A magnificently dazzling sight! After listening to the address of welcome from the King (by his exponent, as he never speaks in public) the President of the Congress, Secretary-General and Mayor—the different nationalities were called upon to respond, and when our beloved country was called, there was no one on hand. What a want of organization on the part of our delegation (or delegate supposed to be the organizer, if not the mouth-piece of this body)! “’Tis an ill wind,” etc., however, as the Spaniard seemed to think this a beautiful piece of courtesy on the part of the United States. In the evening at 10, the Mayor’s palace was now thrown open—a most beautiful reception. Here again the host failed to reckon on his guests—the tickets were short.

On the morning of the 24th, at 9.30, the Congress, in sixteen sections, came together in the different salons of the National Art Gallery (of modern work) and Museum, and unfortunately for three reasons, these commodious halls were anything but working places for a scientific body. First, the walls were all hung and every available inch covered with masterpieces of painting (not considered so here because of want of age), hence diverting, if not to the Castillian, surely to the Anglo-Saxon. Second, the institution is always open to the sightseer—many of these of our own profession—who was constantly walking through from one salon to the other. Third, there being no doors, the speaker in the next sections, right and left, could be heard, and the applause was frequently in the wrong place for the reader. The sections in session from 9 a. m. to 12 m.

There were 6,961 delegates, 195 of whom were from the United States. There were nearly two thousand titles of paper sent in to Secretary-General Caro, so you can see there was no lack of material for “neuron” exercise. The time of each paper was limited to twenty minutes and discussion to five minutes. The great majority of valuable papers was read and discussed in Spanish—and if there is anything (beside wine, women, song and the bull ring) that the Spaniard is fond of, it is discussion; and although the discussion was unintelligible to most of us, there is no keener thrust you can give a Castillian than to get up (with



American rudeness) and leave the hall while he is speaking. As usual, a great many of the American "title-writers" were conspicuous by their absence when called. This is rather characteristic of America. Again, quite a number "turned the barrel over" and re-read from printed monographs.

Spain will astonish the medical man. The kingdom abounds in up-to-date searchers for medical and surgical truths. We, of England and United States, as Sir Henry Norbury, Director-General of the British Navy, Medical Department said: "The English-speaking world (?) have not known our neighbors. Either we have been too well satisfied with ourselves, or our sister-country too close and diffident." Their colleges, laboratories, hospitals, journals and teachings are most assuredly up-to-date, and in some respects we would do well to follow their precepts and examples. For instance, take Dr. Robio-y-Gali's journal, "*Revista Ibero-Americana de Ciencias Medicas*," with over 300 pages, containing nothing save original work and no advertisements—up-to-date and advanced!

A peculiarity of the Congress was the absence of a general exhibition of instruments, appliances—electrical or otherwise; there were no proprietary medicines, no samples, foods, drinks or books.

There is no doubt too that there was too much of sight-seeing; hence the sections were not as well attended as they should be. The Castillian is certainly the grandest of hosts. On the afternoon of the 24th, at 3, a magnificent full dress reception of welcome by the King was given at the Palace Royal. The entire Congress was passed in review by Alfonso, the Queen Regent, the Infanta and Infanta Isabel, each one in turn stopping and talking with two or three or more of each delegation. Ours, headed by our beloved Surgeon-General O'Reilly and Surgeon General Senn, cared for and introduced by our bright and genial minister, Mr. Hardy, assuredly compared well with the others, as was evidenced by each of the Royal party delaying so long and talking with quite a number of our delegates. The young King is certainly very bright and much of a man, and we were all favorably impressed by his noble and unassuming manner, even

speaking cheerfully to the Cuban delegation, which was on our immediate left. The Queen Regent, (Maria Christina, the Austrian,) did not stop or speak to our neighbors. The Infanta has a strong, kind face, markedly unassuming, goes and lives with and is worshipped by all Spaniards. She is a true Mercedes. After the reception we were asked to the Patio and here had a feast for the eyes—ten millions worth of most beautiful tapestry—the largest collection in Europe.

Saturday, the 25th, a. m., was spent at the Military Section from 9 to 12. The program as announced in the *Diario Oficial* for the day consisted of reports upon the following subjects:

1. Advantages and Inconveniences of Compressed Medicines in Field Service, by Messrs Ubeda y Correal and Mazzoni.
2. Influence of Military Life upon the Development of Affections of the Nervous System with Special Reference to Psychoses, by Señor Salinas.
3. Hygiene of Land and Sea Forces on the Western Coast of Africa, by Dr. Angel Fernandez-Caro.
4. Prophylaxis of Syphilitic and Venereal Affections in the Army, by Drs. Rodriguez Vázquez and Favre and Captain Rudberg.
5. Hospital Accommodations in Modern Ships of War, by Don Juan Redondo and Dr. Francesco Coletti.

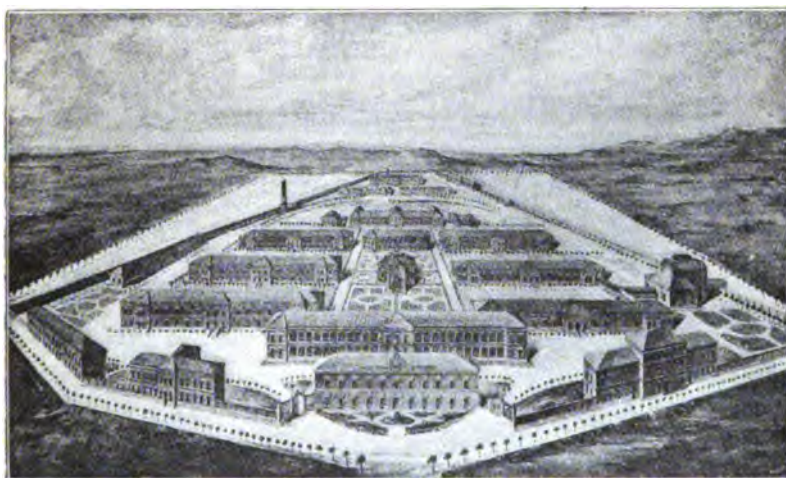
The President of the Section was Dr. Antonio Serrano y Borrego, the senior Medical Officer of the Spanish Army, and the Secretary was Dr. D. Hermenegildo Tomas del Valle.

In the afternoon we were given a drive out five miles to the Hospital Militar, and after visiting almost numberless "units," operating rooms, laboratories, supply room, etc., were highly entertained by a royal lunch, followed by a most excellent hospital corps and ambulance drill. Reaching the hotel about 6 p. m. Dinner—and then again in full dress uniform, whirled off in carriages to the most princely reception given by the Secretary of State. This reception was one of the most beautiful we have ever seen or attended. It would have been impossible for a Caesar in Rome's golden age to have entertained with more magnificence.

On Monday, the 27th, the military surgical section, convened at 9 in the morning. Only one paper was read:

"The Problem of Tuberculosis in Armies," by Professor Stricker, of Berlin.

It was replete with interest and occupied the attention of the section the entire morning. At one p. m., a beautiful luncheon was given by the medical officers of Madrid to the section, and the afternoon was spent in the University and National Chemical Laboratory. Here all the medical supplies are made for the Army and Navy. In the evening the section was invited to attend the opera at the Theatre Lyric.



**Birdseye View of the Military Hospital of Carabanchel.**

On Tuesday, April 28th, at the usual hour, the section was called to order with Colonel Nicholas Senn, delegate from the Association of Military Surgeons of the United States in the chair. Upon this occasion the Association was also represented by the reading of a paper on:

"The Effects of Bullets on Soft Tissues," by Brig. Gen. J. D. Griffith, Retired, N. G. Mo.

Following this a paper was read on the:

"First Dressing on the Battlefield," by Colonel Nicholas Senn, of Illinois.

who also demonstrated his new emergency package, characteristic in its simplicity, excellence and the ease of application, being the best so far for use. Its adoption in our army should follow.

Now the Colonel presented his new, beautiful and most thoroughly compact operating case, one of which every regiment in the United States Army should be supplied with—not larger than the old cartridge box, and instruments, in canvas (with extra folder) ready for throwing into boiling water and containing everything necessary for any operative interference. This case he presented to the Navy of Spain.

Other papers upon the program were:

1. Importance of Phonendoscopy of the Spleen in Military Medicine, by Prof. A. Bianchi, of Paris.
2. The Treatment of Sea Sickness, by M. Madeuf, of Paris.
3. Preventable Diseases in Armies, by Major Seaman, of New York.



**Surgical Ward in the Military Hospital of Carabanchel.**

4. Plan for the Medical Instruction of Captains of Vessels not Supplied with Medical Officers, by Dr. Sánchez de Silvera.
5. On Operation for Certain Affections which Otherwise Exempt from Service in the Roumanian Army, by M. J. Potarca.
6. Field Service; Organization of the First Line, by M. Fernández Giào, of Lisbon.
7. Compressed Medicines in Human and Veterinary Medicine, by Dr. Pierre Laurent.
8. New Methods for the Control of Malaria in Formosa, by Dr. Uyama
9. Asepsis and Antisepsis in Active Service, by Dr. Pérez Ortiz.
10. The Necessity for Military Sanatoria in Spain, by Dr. D. Hermenegildo Tomas del Valle.
11. The Hygiene of Alimentation in Town Plazas, by Dr. Larra y Cer-  
ezo.

12. Pulmonary Tuberculosis in the Spanish Army, by Dr. Deleito.
13. Prophylaxis of Venereal Disease in the Army, by Dr. Isidro Garcia
14. The Method of Treating the Problem of Tuberculosis in Naval Institutes, by Dr. Onsalo y Morales and Dr. Tallero y Sanz.
15. Vaccination and Revaccination in the Spanish Army by Dr. Alabern y Raspail.

The afternoon was spent in visiting the Rubio Hospital and the Navy Museum and Hospital, having been invited and accompanied by Captain Juan Redondo of the Navy, one of Spain's most noble sons. This beautiful hospital is located north and west of the city, just outside of the old city walls, and on an ele-



**Medical Ward in the Military Hospital of Carabanchel.**

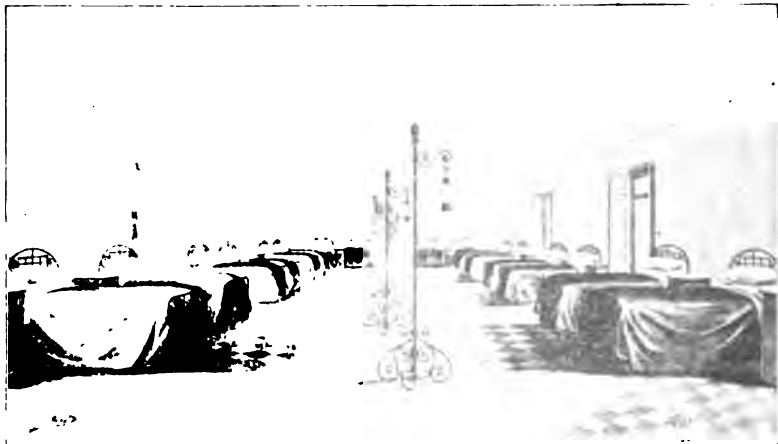
vation just to the right of the entrance to the Royal Park. From here you have a most beautiful view of the Capitol. Colonel Senn in the evening entertained our good friend and Madrid "Salvator," Captain Redondo, at a beautiful dinner.

On Wednesday, April 29th, a good morning's section work was followed by a beautiful farewell luncheon and short speeches. In the afternoon the Royal Family entertained the Congress at a most beautiful garden party in the Palace Gardens. A most delicious luncheon was served in the open and champagne was a great deal freer than water. The King, his mother, aunt and sister, were drawn up in the Royal carriage and alighted to the

strains of six bands of music (one as fine as ever heard, composed of sixty-three professors of the art) and mingled everywhere in the throng of guests. The evening was spent by a great number of delegates at the residence of our Minister.

On Thursday, the 30th, the General Conference was held at San Carlos College of Medicine, and Dr. Howard A. Kelley, of Johns Hopkins delivered the address on behalf of the United States,—the sections following with the election of officers for the next Congress to be held at Lisbon.

The Fourteenth International Congress is now numbered among the things that were—it is now a matter of history. Let



**Ward in the Military Hospital of Carabanchel.**

the good that men do live after them ! Let's bury the evils, looking upon the sins as those not of commission but purely omission—and make everyone happier and better by trying to correct patent mistakes, remembering that "to err is human; to forgive divine." The Committee in charge have undertaken and accomplished satisfactorily to a great extent, an Herculean task, and we thank them one and all from the bottom of our hearts; and if at any time we may have given offence, we most humbly apologize, aiming, as we hoped to cement our beloved country with an everlasting love to beautiful and glorious Hispania.

A few suggestions we hope may not be out of the way:

The rules for membership are entirely too lax. Delegates should emanate from national organizations. The American Medical Association and the Association of Military Surgeons, U. S. A. are the only two bodies in the United States that should appoint delegates, and these in the proportion of one to 100 members; and these only should be allowed on the floors of the General Assembly or Sections. This, if attended to by properly appointed committees, will give to the delegation a standing and organization, neither of which were obtained at Madrid. The Government should appoint from the Association of Military Surgeons official delegates.

No layman should be allowed to register.

No one should be allowed to register without filing first with the Secretary-General his papers or certificates from delegating body, these to be kept in the archives of the Congress.

Before bidding a fond farewell to Spain—proud and beautiful home of the noble and chivalric Castillians—we wish to repeat our sincere thanks for the most delightful fortnight in our life's span. May Heaven's richest blessing ever be hers.

#### EPILATION AMONG THE CALINGAS.

WHILE stationed at Ilagan, Isabela Prov., Luzon, in 1901-1902, I noticed that the bodies of the Calingas, "natives who inhabit the hills in the neighborhood of the headwaters of the Cagayan river," were entirely devoid of hair. I questioned them and learned it was their custom, to pull out all hair that appeared on their pubes, breasts, and arm-pits. Whether this custom prevailed among their women I did not learn, but all the men practiced it; also whether this was a religious ceremony, or not, I could not learn, on account of lack of an interpreter. The hair was plucked in the following manner: The native takes a flat piece of bamboo about six inches long and one inch wide, and splits it about half its length, this gives it a spring, then he forces open this split or slit, and slides it over the hair to be plucked, and grasping the bamboo on each side of the hair gives it a quick pull and out it comes; each individual hair is pulled alone. I do not know if this custom is practiced by any other tribe of Filipinos. These Calingas belong to the Head-Hunter group of natives.—CAPT. FREDK. H. SPARRENBERGER, U.S.V.

## NOTES FROM THE EXPERIENCES OF A MEDICAL OFFICER IN THE TROPICS.

BY MAJOR CHARLES FRANCIS MASON,  
SURGEON IN THE UNITED STATES ARMY.

THE following notes are based upon the writer's experience as a medical officer during a service of about nine months in Porto Rico, and about seventeen months in the island of Panay, Philippine Islands. During the latter period he served for about a year as Chief Surgeon of a district which embraces all of that island except one town, and in his frequent tours of inspection had an unusual opportunity for varied experiences. As an official report was made to the Surgeon General's office of everything deemed of interest, this paper is necessarily a restatement of those reports with comments, the result of fuller experiences.

### DISEASES IN THE TROPICS.

I use this term instead of "Tropical Diseases" because there are few, if any, tropical diseases—that is to say, diseases which occur only in the tropics, and the relative prevalence of particular diseases is very different from that obtaining in temperate climates.

As to acclimation, if by that term it is intended to convey the idea that a man by long residence in the tropics acquires a certain degree of protection against diseases prevailing there, then in my opinion there is no such thing as acclimation; that he does learn how to take better care of himself, and to that extent is less liable to disease, there can be no doubt, but there is, as a rule, a steady deterioration of health and each year the man becomes less fit for service. I do not believe that a soldier should be kept continuously in the tropics longer than three years; two years would be better.

The following is an extract from a report to the Surgeon General from the Philippines, November 15, 1900:

"I am struck with the relative infrequency here of certain



diseases common in Porto Rico, while certain other diseases often met with here were of rare occurrence there. This difference is shown in the following table:

DISEASE.	IN PORTO RICO.	IN PANAY.
Filaria sis.....	Common among natives.....	Rare or absent.
Ankylostomiasis.....	do. do.....	do. do.
Chiggers.....	Common among soldiers.....	do. do.
Syphilis.....	Common among natives and sold'rs.....	do. do.
Malarial fevers.....	Common among soldiers.....	Uncommon.
"X" fever.....	do. do.....	Rare or absent.
Pyæmia.....	Uncommon.....	Not rare among soldiers.
Beri-beri.....	Rare or absent.....	Common among natives.
"Y" fever.....	do. do.....	do. do.

"While I have not seen a case of syphilis originating here, other venereal diseases are abundant; in Porto Rico syphilis was a scourge.

"This island had the reputation of being malarious, but I did not see a clearly defined case until the return of two of our companies from field service in Negros, when a large percentage of those organizations were affected with typical malarial intermittent. Unfortunately, I had no microscope, but the disease yielded promptly to quinine. Since a microscope has been available the only malarial organisms I have found have been in patients who have suffered severely with malarial fever in Cuba.

"The fever which I call 'X,' as denoting my ignorance of its nature, I have not seen here, while it was very common in Porto Rico. It was evidently of a specific nature; began suddenly with chilly sensations, high fever, nausea, frequent vomiting, constipation, headache. After five days to a week the temperature fell to normal, with slow pulse, jaundice, and albuminuria. The patients appeared very sick but always recovered.

"'Y' fever, also an unknown quantity, occurred here epidemically at the end of the dry season. Like 'X' it was evidently specific, beginning abruptly with chilly sensations, headache, rheumatic pains, and high fever. There was usually a sudden fall to normal in five or seven days, the drop in temperature being attended with profuse sweating and marked weakness. There was no eruption, no secondary fever, no jaundice. The patients all recovered, but slowly, and convalescence was often accompanied by obstinate neuralgias. This is the disease that was often diagnosed "dengue," but it frequently occurred in patients only recently recovered from the latter disease, and must not be confounded with it. True dengue also prevails here. The pyæmia referred to is a very interesting condition, but though I have seen a number of cases they were all in hospitals not under my charge, and I can only briefly refer to it. Its distinguishing

feature is its origin without apparent cause. The patient begins to lose health and strength and to have chills, fever, and sweating : then some limb or joint is observed to be swollen, and upon examination pus is found. The abscesses are nearly always large, deep seated, and uncircumscribed ; favorite sites are the groins, axillae, and the buttocks. One after another they are opened and drained, until the patient usually dies from exhaustion and septicaemia. Most of the cases have given a history of antecedent gonorrhea, and in the absence of more obvious causes this possible source seems worth considering.

"Dysentery and diarrhea are about equally common in both islands, but there is a type of diarrhea here which I did not see in Porto Rico. This form of disease closely resembles in symptoms the 'hill diarrhea' of Manson, but prevails at all levels. It occurs epidemically at the commencement of the rainy season, and is characterized by profuse, pale, watery, frothy stools with much flatulence and colic, the movements commencing after midnight, almost or entirely ceasing by noon. It appears to be dependent upon suspension of the functions of the liver and consequent flatulent indigestion, the result of overeating, and chilling of the abdominal contents by cold drinks, exposure to cold in the early hours of the morning, and excessive dampness.

"Dysentery prevails throughout the year, but there is a marked increase in the number and severity of the cases at the commencement of the rainy season and a progressive increase in both respects until a maximum is reached toward the end of August. It is by far the most serious disease which attacks the white soldiers in the tropics both as regards its mortality and its invaliding effects. Out of 32 deaths from disease in the Twenty-sixth United States Volunteer Infantry during its first year of service in the Philippines Islands, 16 were from dysentery and its complications, and 10 more from typhoid fever.

"Boils, abscesses, and leg ulcers are very common, the latter especially during campaign, when it is impossible to keep the underclothing clean. Though not dangerous to life, these seemingly trifling ailments put a large number of men out of service temporarily and correspondingly swell the sick report.

"Suppurative inflammation of the middle ear with perforation of the drumhead is of frequent occurrence. It is insidious in its commencement, often deafness and sudden discharge of pus being the first symptoms noticed. Upon examination an acute catarrhal pharyngitis is usually found.

"Another interesting condition is the prevalence of buboes, both in the groin and axilla, without discoverable point of origin. Frequently a careful examination of the tributary lymph district

fails to reveal any lesion whatever; and this though the bubo may proceed to suppuration.

"Smallpox, which is widely prevalent during the dry season, disappears almost completely during the rains. Possibly this may be explained by the greater freedom of communication in the dry season, or more probably by the active agency of dust as a carrier of infection."

Since that report was written Dr. Strong has reported one case of filariasis from the Island of Panay, and that ankylostomiasis is not infrequent in Manila.

My later experience after comparatively peaceful conditions obtained in Panay and the native women returned to the garrisoned towns, proved that syphilis was more common than I had thought, but still not nearly so prevalent as in Porto Rico. My experience with malarial fever was unchanged.

The fever designated in the report as "X" fever, I am now convinced is what is known as "Weil's Disease," or infectious jaundice. "Y" fever I am still unable to classify.

The opinion advanced in some of the earlier reports from the Philippines that typhoid fever did not exist there before the arrival of the American troops is a great mistake; careful inquiry has convinced me that it is widely prevalent among the natives and always has been; it is not, however, always correctly diagnosed. The disease is more severe than in the temperate zone, and more fatal in its results.

Diphtheria is said to occur, though I did not see any cases. Scarlet fever appears to be unknown. The type of variola that occurs in the tropics is very different from that prevailing so widely in this country; there it is the "real thing," and there is never any doubt about the diagnosis.

Looking back over my experience of diseases in the tropics, gastro-intestinal disorders, and especially dysentery and diarrhea, loom up as of overshadowing importance; as causes of non-efficiency, invaliding and death, all other diseases are of minor importance; and I cannot help feeling that a large percentage of the cases are preventable. Errors of diet, abuse of alcoholics, chilling after overheating, especially at night, excessive fatigue, and the use of the heavy cartridge belt, are powerful predisposing causes, while the actual infection is taken in through the mouth

in impure water or uncooked food. In a country like the Philippines where all excrement is dropped on the ground under the houses, and the water taken from a shallow uncurbed well a few feet distant, it is not difficult to trace the source of infection. The soft drinks, such as ginger-ale, soda, etc., made from the foulest kind of water and bottled by the natives, were, in my opinion, far more dangerous than their alcoholic drinks. When the troops in garrison are properly housed and furnished with an abundant supply of pure water, and the Forbes-Waterhouse sterilizer is as necessary a part of the equipment of a field column as is the ammunition, we may look for a marked decrease in the sick-rate among our troops serving in the tropics.

Another and very important factor in causing sickness out there is a combination of ennui and homesickness. Still more important is it in causing unfavorable results in those already sick. I am certain that it is a factor that has not thus far been given sufficient consideration. I have noticed that troops in the field in campaign were often in better health than when in garrison under apparently better conditions.

In some places there was absolutely no amusement outside of the cock-pit and saloon; men became morbid and homesick, and fell an easy prey to disease. When they did get sick they thought of nothing but home, and if the disease proved intractable and they had set their hearts on going home, it was death not to send them. I have seen more than one poor fellow, when he found his name was not on the list of those to be sent, turn his face to the wall and rapidly fade away; and on the other hand; I have seen those whom it was not believed could stand the trip, mend so rapidly when they found their faces turned toward home, that their improvement was almost incredible.

Every effort, therefore, should be made to supply diversion and recreation for the men in garrison. All the amusement features of the post exchange should be fully developed; athletic sports should be encouraged by the officers and a field day held at least once or twice a month. Men with gastro-intestinal disorders which do not yield to treatment within a reasonable time, those suffering with relapses of that nature, and all tuberculosis patients, should be sent home promptly.

The so-called "dhobie" or laundryman's itch is a very intractable form of skin disease, which causes intense annoyance and considerable disability. This name is generally applied to any itching eruptions in the groin and axilla, but is properly used only in connection with a ringworm affecting these localities. It is a form of *tinea* requiring a certain degree of heat and moisture for its development, and disappears without any treatment when the person affected goes to a cold climate; it is cured without much difficulty, but relapses are apt to occur from the original cause. The infection is usually conveyed through the filthy methods of the laundrymen, and the advent of the steam laundry with boiling of the underwear would no doubt largely do away with it.

The common tropical ulcers, too, are largely the result of uncleanness under unusual conditions of heat and moisture, favorable to the growth of bacterial life, and will become much less common under peace conditions.

Intestinal parasites, which are very common, are the result of the filthy habits of the natives as to the disposal of excreta, and of the carelessness of the soldiers as to what they eat and drink. They should become much less frequent under improved sanitary conditions.

Liver abscess with, and sometimes without, a history of dysentery, is frequently seen and is usually amenable to surgical treatment; in the multilocular form, however, that organ is often found riddled with small abscesses rendering any form of treatment hopeless.

Hernia was of frequent occurrence; there were several factors in its causation, but the waist belt full of cartridges, weighing eight pounds, and pressing down the abdominal contents on a ring already weakened by loss of fat and muscular relaxation, was an important cause often complained of by the men; it, together with the violent exertion demanded of overloaded men, explains many of these cases.

Tuberculosis was very common, and ran a much more rapid and virulent course than in a temperate climate; the only hope for such cases was to send them home as soon as the diagnosis was made.

## SANITATION.

Bearing in mind the importance of diarrheal diseases in the tropics, the first sanitary measure which suggests itself is safeguarding the water supply. In permanent camp this should be done by furnishing an abundant supply of cold boiled water by the Forbes-Waterhouse process, and by absolutely prohibiting the sale of soft drinks made from native water.

In the field with small detachments the camp kettle and tin cup must be depended upon for supplying boiled water, but whenever there is transportation of any sort complete arrangements should be mandatory, special carts or pack animals being used; Forbes-Waterhouse sterilizers, with extra parts and instruments for repairing punctures, etc., covered metal water-cans in nests, and an abundant supply of petroleum should be taken along. The carrying of this equipment should be made obligatory when there is any transportation, for whenever there is a question of cutting down the allowance many line officers will immediately reduce that of the Medical Department. A detailed enumeration of what should be taken is necessary for I have many times seen these sterilizers lying idle when they were much needed, simply because of a puncture, the loss of some small part, or the absence of fuel or proper water receptacles.

There should be a detailed official description of the method of disposal of excreta in the field, in temporary camps or cantonments, and in permanent posts. If this is not done every medical officer of greater or less or no experience will have in operation a different method, and many of them the worst possible. In the field there should be a permanent detail in each company or battalion, whose duty it should be immediately upon reaching camp to dig the necessary company and hospital sinks, to see that they are covered at least twice a day, and filled and marked before the camp is abandoned. In more permanent camps or cantonments the trough and lime water system should be used, while in permanent posts only water carriage should be tolerated. The police detail should also attend to the kitchen sink and to the destruction and burial of all garbage and refuse.

The clothing is satisfactory, except for the head covering and the waist belt. A suitable helmet protecting the temples and the nape of the neck should take the place of the campaign

hat which is not fit for tropical service; I have personally tried both and know whereof I speak. In a series of experiments in the Philippines I have found that with the khaki helmet, issue pattern, worn in the sun, a thermometer placed inside of it did not indicate above 92° F., the lowest temperature the thermometer was capable of indicating; how much lower than this the actual temperature may have been I am unable to say. Under the same conditions, a thermometer placed in the campaign hat, issue pattern, with side ventilators, indicated a temperature of 100 2° F.

The waist belt to hold up the trousers predisposes to hernia; its use should be discontinued and suspenders issued instead. Reference has already been made to the influence of the cartridge belt worn about the waist, in causing hernia and diarrhea; the weight of the belt should be borne by straps over the shoulders, or better still, the belt should be done away with altogether and be replaced by a bandolier.

The first aid packet should always be carried suspended from the bottom of the cartridge belt behind, in the little pocket now known as "Hoff's."

The question of the best ration for the tropics is slowly solving itself; despite theoretical considerations, officers of long and varied experience in the tropics are convinced that the present ration with its increased allowance of sugar and the variations of which it is capable fills all requirements. The element of increased tissue waste in the tropics seems to have been lost sight of in most of the essays on this subject, the function of the ration seeming to have been considered only the supply of heat and energy.

There is no doubt but that a great deal of the sickness among the troops in the Philippines was due to the insufficient attention given to the matter of exercise and amusement for the men. It was a subject of common remark that the health of the command was always better in field than in garrison, and this, too, despite the exhausting work and often great exposure under the former conditions. In the field there was regular exercise and the mind was constantly occupied with the too often elusive hope of a fight. In garrison, there was little exercise beyond a short routine drill while of amusement there was absolutely none.

In all permanent garrisons the amusement features of the post exchange should be fully developed, and the men should be encouraged by the personal examples of their officers to take part in athletic sports, such as baseball, basketball, rowing, etc. Field days should be held at least once a month with small prizes in each event. Entertainments, such as band concerts, theatrical performances, magic lantern exhibitions, etc., should be as frequent as possible.

#### EQUIPMENT OF THE MEDICAL DEPARTMENT.

One of the first things that struck me was the lack of a sufficiently distinctive uniform for the Medical Department and Hospital Corps. The khaki blouse was seldom worn and when it was worn the green shoulder straps could never be obtained; the same was the case with the green hat-cord. Wearing the blue shirt and khaki trousers, the habitual field uniform, the Hospital Corps man or Medical Officer could not be distinguished from anyone else.

With the flannel shirt and khaki trousers, both officers and men should wear the bronze medal caduceus on each side of the collar, and the officers the insignia of rank as now authorized. Under the new regulations an advance has been made in that the distinctive hat cord is to be sewed on the hat, but, in addition, in the case of enlisted men, the caduceus should be worn on the front of the hat.

The Hospital Corps pouches are defective in the following respects: they are not water proof; the thread with which they are sewed is not nearly strong enough; the inside loops are so variable in size that it is impossible to secure uniformity in packing them; the dressing case is made of gummed paper and goes to pieces the first time it gets wet; it should be of canvas and sewed.

Supply depots should have a liberal provision of everything necessary to refit the pouches, cases, chests, etc., of the Medical Department; also extra parts of all apparatus. At each depot should be stationed an expert instrument maker, capable of sharpening instruments, repairing and putting them in order. It should be made an easy matter to turn in unserviceable cases, chests, etc., serviceable ones being issued in their places while the old ones are being fitted up.



## Reprints and Translations.

### THE FIRST AID PACKET IN NORWAY.

**I**N December 1902, it was determined not to issue the first aid packet thereafter to every soldier of the Norwegian Army, but to supply it in large numbers to the men of the Medical Corps and to various establishments of the medical department, viz, Medical Corps Companies, and Field and other Hospitals. Under the direction of the Surgeon General numerous experiments have been made with the packet. Large numbers were distributed among the Infantry, Artillery and Cavalry. These were afterward collected and examined by a commission consisting of two medical officers and a military apothecary. The bacteriological examination was made at the Hygienic Institute of the University of Norway. All of the chemical investigations were made in the chemical laboratory of the same institution. It was determined by these examinations that the contents of the packets remain in good condition in spite of the soiling of the cover. This packet,—identical in composition with the German army packet,—will retain its efficiency for a long time when properly kept among the army medical supplies, but it lacks the absolute stability which would be necessary for long use by the combatant soldier. The Norwegian commission holds, that while it is desirable to have material for bandaging, wounds should not be so treated by every soldier, but should be let alone until they can be dressed by a competent man. It has always been considered a great inconvenience for a fighting soldier to leave the ranks, sometimes really to help and sometimes under the pretext of helping a wounded comrade. This inconvenience would still be present if the first dressing were generally to be made by line soldiers, and one of the chief advantages of a perfect military organization for battle would be spoiled. The Surgeon General of Norway considers that the first aid packet is a handy and very practicable bandage and should be present in great numbers in the material to be used on the first line but that it should not be distributed to the soldiers of the line.

HANS DAAE.

# Medico-Military Index.

## MEDICO-MILITARY BIOGRAPHY.

Didiot, Médecin (Le) inspecteur general [1823—1903.] *France méd.*, Par., 1903, I, 53.

Marvaud (Angel) [1844-1902.] Biography. *Bull Acad. de méd.*, Par., 1902, 3. s., xlviii, 490.

Remmert (Adolf Aleksandrovich) [1835-1902.] Piotrovski (F.) [In memoriam.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, off. pt., 493-514, 1 port.

Sommer (Richard Herman Ernst) [1851-1902]. (Biography by "A.") *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 49-51.

Wilm (Max) [1862-1902]. [Biography by Bassenge.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 48.

Moore (N.) On some famous medical officers of the army. *Lancet. Lond.*, 1903, I, 565-569.

## MEDICO-MILITARY HISTORY AND DESCRIPTION.

Ambulance work in country districts of Germany. [Transl. from Illustr. Ztg.] *Scient. Am. Suppl.*, N. Y., 1903, lv, 22676.

Italian army medical organization in peace and war. *Brit. M. J.*, Lond., 1903, I, 886.

Antony. [The Medical Corps of the Austro-Hungarian army.] *Arch. de méd. et pharm. mil.*, Par., 1903, xli, 253-276.

Antony (F.) The Medical department of the Russian Army.] *Arch. de méd. et pharm. mil.*, Par., 1903, xli, 157-180.

Bomann (E.) [Changes in the sanitary service of the Swedish Army from the new army organization.] *Norsk Tidsskr. f. Mil.-Med.*, Kristiania, 1901-2, vi, 31-33.

Brunner (C.) [The wounded in the wars of the old Swiss Confederacy. History of military hygiene and surgery in Switzerland from the beginning of the Confederacy up to the 17th Century.] *Beitr. z. klin. Chir.*, Tübing., 1903, xxxvii, 1-174.

Kerr (W. J. W.) Records, recollections and reminiscences; annual address of the president of the Association of Medical Officers of the Army and Navy of the Confederacy. *South. Pract.*, Nashville, 1903, xxv, 325-349.

Kobro (L.) [Diseases during the maneuvers of 1901.] *Norsk. Tidsskr. f. Mil.-Med.*, Kristiania, 1901-2, vi, 117-119, 1 tab.

Lewis (S. E.) General T. J. Jackson (Stonewall) and his medical direc-

tor, Hunter McGuire, at Winchester, May 1862; an important incident of the Shenandoah Valley campaign. *South. Pract.*, Nashville, 1902, xxiv, 553-564.

**Popoff (K. M.)** [On a military Koomis hospital.] *Voyenno-med.*, J., St. Petersburg., 1903, lxxxi, med.-spec. pt., 302-315.

**Steiner (J.)** [On medico-military periodicals.] *Allg. mil.-ärztl. Ztg.*, Wien, 1903, 9-16.

**Thooris.** [The field of evolutions of the camp at Sissone.] *Arch. de méd. et pharm. mil.*, Par., 1903, xli, 193-218.

**Thrap-Meyer.** [The military hospital at Kristiania.] *Norsk Tidsskr. f. Mil.-Med.*, Kristiania, 1901-2, vi, 49-56.

### MILITARY HYGIENE.

**Slovtssoff (B. L.)** [New investigations in the physiology of marching.] *Voyenno-med. J.*, St. Petersburg., 1903, i, med. pt., 425-448.

**Sobolevski (A. V.)** [Treatment of syphilis in the army.] *Voyenno-med. J.*, St. Petersburg., 1902, lxxx, med. spec. pt., 4506-4517.

**Timofeyeff (P. V.)** [Artificial hydrocele to avoid military service.] *Voyenno-med. J.*, St. Petersburg., 1903, i, med. pt., 459-462.

**Tissié (P.)** [New regulation for instruction in military gymnastics.] *Rev. scient.*, Par., 1903, 4. s., xix, 715-719.

**Welch (F. H.)** The national health and army recruiting statistics. *Lancet*, Lond., 1903, i, 684.

**Winter (F.)** A brief review of antimalarial sanitary work at Jefferson Barracks. *Med. Fortnightly*, St. Louis, 1903, xxiii, 313-320.

**Yorke-Davies, (N. E.)** The feeding of the soldier; the lesson of the great Boer war. 4<sup>o</sup>. London, 1903.

### MILITARY SURGERY.

**de Alarcón (C. L.)** [Wounds of the chest by fire-arms.] *Rev. de san. mil.*, Madrid, 1903, xvii, 21-26.

**Butza.** [The individual package for dressing wounds in the Roumanian army.] *Caducée*, Par., 1903, iii, 62.

**Ellis (T. S.)** Fracture of metatarsus in marching. *Brit. M. J.*, Lond., 1903, i, 1061.

**Freer (E. L.)** The later records of gunshot injuries in the war. *Brit. M. J.*, Lond., 1903, i, 998.

**Hamann (B. H.)** [Inaugural dissertation: On subcutaneous fractures of metacarpal and metatarsal bones, with especial reference to military œdema of the foot.] 8<sup>o</sup>. Greifswald, 1902.

**Hecker.** [Demonstration of Utermöhlén's aseptic bandage for rapid first aid.] *Deutsche mil.-ärztl. Ztschr.*, Berl., 1903, xxxii, 60.

**Hildebrandt.** [Prognosis of gunshot wounds on the battle-field.] *Deutsche Ztschr. f. Chir.*, Leipz., 1902, lxvii, 10-36.

**McCurdy (S. L.)** How can the surgeon who has no hospital facilities secure better antiseptic surroundings? *Railway Surg.*, Chicago, 1902-3, ix, 195.

**Martinelli (V.)** [Actual state of abdominal surgery for wounds from side arms (armes blanches); personal contribution of eleven cases.] *Riforma med.*, Roma 1903, xix 258-262.

**Millard (P. E.)** Wound of the jaw by a soft-nosed bullet. *Brit. M. J.*, Lond., 1903, i, 490.

**Nimier & Laval (E.)** [Laparotomy in penetrating wounds of the abdomen from small-calibre bullets.] *Caducée*, Par., 1903, iii, 103-105.

**Oertel.** [The effect on bones of "brush" wounds from modern firearms.] *Deutsche Ztschr. f. Chir.*, Leipz., 1902, lxvii, 612-644, 4 pl.

**Perthes (G.)** [Ready aseptic bandages for military surgery.] *München. med. Wchnschr.*, 1903, l. 255.

**Raehlmann (E.)** [On the significance of trachoma in the army and the defence of a country.] *Heilkunde*, Berl., 1902, 529-536.

**Ravich-Shtsherbo (A.)** [Cases from the surgical division of the Lomzhinsk local hospital.] *Voyenno-med. J.*, St. Petersburg, 1902, lxxx, med. spec. pt., 4096; 4372.

**Regnier (L. R.)** [Application of Röntgen rays to medical service in the field.] *Caducée*, Par., 1903, iii, 76.

**Santoro (G.)** [Contribution to the treatment of urethro-perineal fistulae and considerations on gonorrhœa in soldiers.] *Gior. med. d. r. esercito*, Roma, 1902, l, 1271-1285.

**Sapper (K.)** [Central American weapons in use to-day.] *Globus*, Brunschwg., 1903, lxxxiii, 53-63.

**Spina (V.)** [Pathological perforations of the tympanum in relation to military service.] *Gior. med. d. r. esercito*, Roma, 1903, li, 98-118.

**Torel.** [Accidents produced by deleterious gases from smokeless powder.] *Arch. de méd. nav.*, Par., 1903, lxxix, 373-380.

**Wilmaers.** [Inguinal hernia; considered from the point of view of military service.] *Arch. méd. belges*, Brux., 1903, 4. s., xxi, 5-31.

# The Enno Sander Prize

The Essayist securing First Place will receive

**A GOLD MEDAL**  
of the value of  
**One Hundred Dollars**

The Essayist securing Second Place will receive

**A LIFE MEMBERSHIP**  
IN THE ASSOCIATION,  
of the value of  
**Fifty Dollars.**



**SUBJECT OF THE COMPETITION FOR 1904 :**  
**THE RELATION OF THE MEDICAL DEPARTMENT**  
**TO THE HEALTH OF ARMIES.**

## CONDITIONS OF THE COMPETITION.

1. Competition is open to all persons eligible to Active or Associate Membership in the Association of Military Surgeons of the United States.
2. The prize will be awarded upon the recommendation of a Board of Award selected by the Executive Committee. The Board will determine upon the essay to which the prize shall be awarded, and will also recommend such of the other papers submitted, as it may see fit for honorable mention, the author of the first of which shall receive a life membership in the Association.
3. In fixing the precedence of the essays submitted, the Board will take into consideration—primarily—originality, comprehensiveness and the practicability and utility of the opinions advanced, and—secondarily—literary character.
4. Essays will consist of not less than ten thousand, nor more than twelve thousand words, exclusive of tables.
5. Each competitor will send three typewritten copies of his essay in a sealed envelope to the Secretary of the Association, so as to reach that officer *at least one month before the next ensuing annual meeting*, in the present case on or before September 10, 1904.
6. The essay shall contain nothing to indicate the identity of the author. Each one however will be authenticated by a nom de plume, a copy of which shall, at the same time as the essay, be transmitted to the Secretary in a sealed envelope together with the author's name, rank and address.
7. The envelope containing the name of the successful competitor will be publicly opened at the next succeeding annual meeting of the Association, and the prize thereupon awarded.
8. The successful essay becomes the property of the Association of Military Surgeons of the United States, and will appear in its publications.

## BOARD OF AWARD—1904.

Lieutenant Colonel JOHN SHAW BILLINGS, U.S. Army.  
Brevet Brigadier General GEORGE RYERSON FOWLER, New York.  
Surgeon HENRY GUSTAV BEYER, U.S. Navy.

**John Cropper Wise, President. James Evelyn Pilcher, Secretary,**  
Carlisle, Pennsylvania.



**DR. BENJAMIN CHURCH.**  
**DIRECTOR GENERAL AND CHIEF PHYSICIAN OF THE**  
**AMERICAN ARMY.—1775.**

## Editorial Department.

### The Surgeon Generals of the United States Army.

#### I. BENJAMIN CHURCH, DIRECTOR GENERAL AND CHIEF PHYSICIAN OF THE HOSPITAL OF THE ARMY, 1775..

OF the early life of Benjamin Church astonishingly little is known. His ancestry, as well as the date and place of his birth, is generally supposed to be unknown, but there seems to be good authority for the statement that he was a son of Colonel Benjamin Church of the colonial forces, who killed King Philip with his own hand, and that he was born at Newport, Rhode Island, August 24, 1734. There is no question, however, but that he was graduated from Harvard College in 1754, and, having studied medicine under Dr. Charles Pyncheon, became known as a successful and dexterous surgeon, and an able and accomplished physician. A man of fine presence and attractive personality, he at once achieved a high degree of social popularity while his facile pen and cultured mind early made an impression upon the literature of his period. The reviewers of the day accorded hearty praise to his poem No. XI, in the collection published under the title of "Pietas et Gratulatio"; and his "Elegy upon the Times" published in 1765, is a fine specimen of contemporary satire. His prose was both humorous and philosophical, one of his most notable productions being the annual oration delivered in the Old South Meeting House, in 1773, which was admitted to be one of the very best of the "Boston Orations." He was also a constant contributor to the "Times," a Whig newspaper, which Governor Bernard denounced as a seditious sheet.

He was a man of pronounced public spirit, and participated actively in the stirring events antecedent to the war for American

Independence. He was a prominent member of the "Sons of Liberty" and one of the leaders in the "Boston Tea Party." He was a member of the Massachusetts Provincial Congress and was delegated by that body to lay before the Continental Congress in Philadelphia the anxiety felt in Massachusetts over the presence of the large body of poorly disciplined soldiery in the Colony. When George Washington was appointed Commander-in-Chief of the Revolutionary forces, he was deputed by the Provincial Congress to receive and welcome the General upon his arrival, a function which he performed with notable grace and dignity.

He was a member of a committee appointed by the Provincial Congress for the examination of candidates for appointment as surgeons in the Army, and when an Army Medical Department was organized by the Colonial Congress, Dr. Church was at once appointed "Director General and Chief Physician." It is interesting to note that this medical department organized by the Act of June 27, 1775, was entitled "An Hospital for an Army"—the word "hospital" referring not as now to a specific edifice but to the medical department in general.

Dr. Church soon showed that, notwithstanding his undisputed professional skill, and his distinguished literary and political ability, he was deficient in the peculiar executive qualifications essential in the organization and direction of an Army staff department. This was not surprising for his previous training and methods of life had been such as to dwarf, rather than to develop, such qualities—a condition which has been observed in many later instances in military medical organization. His relations with the regimental medical officers soon became so strained that a tempest of complaints poured in upon Headquarters, and Washington was compelled to order an investigation into the affairs of the department.

About this time occurred the lamentable affair which terminated Church's services to the American cause. For some years, he had been in the habit of spending his leisure hours in dissipation at an elegant mansion which he had put up at Raynham. The construction of this place brought upon him a heavy burden of debt. To these conditions, has been attributed his alleged treachery to the cause in which he had been so conspicuous a



factor, and it has been claimed, without proof however, that for some time previous to the discovery of the presumed evidence against him, he had been in correspondence with the enemy. However that may be, not long after his appointment as Chief of the Medical Department, a discovery was made, which can best be stated in the words of George Washington, addressed to the President of Congress :

"I have now, a painful though necessary duty to perform, respecting Doctor Church, the Director of the Hospital. About a week ago, Mr. Secretary Ward of Providence, sent up one, Wainwood, an inhabitant of Newport to me, with a letter directed to Major Cane in Boston, in occult characters, which he said had been left with Wainwood some time ago, by a woman who was kept by Doctor Church. She had before pressed Wainwood to take her to Captain Wallace, Mr. Dudley the collector, or George Rowe—which he declined.

"She then gave him the letter, with strict injunctions to deliver it to either of those gentlemen. He, suspecting some improper correspondence, kept the letter, and after some time opened it, but not being able to read it, laid it up where it remained until he received an obscure letter from the woman, expressing an anxiety as to the original letter. He then communicated the whole matter to Mr. Ward, who sent him up with the papers to me. I immediately secured the woman, but she was proof against every threat and persuasion to discover the author. However, at length she was brought to a confession, and named Doctor Church. I then immediately secured him and all his papers. Upon the first examination, he readily acknowledged the letter, said it was designed for his brother, etc."

Upon translation by the Rev. Mr. West of the cipher in which the letter referred to by Washington was written, it was discovered to be a statement of the numbers and disposition of the American forces, with assertions of the writer's devotion to the British cause, and directions for continuing the correspondence. When confronted with the document before a military court convened for his trial, Dr. Church at once admitted its authorship, and explained that it was a ruse to impress the enemy with the strength of the patriot forces, to prevent an attack while the Continental troops were unprepared, and to con-

tribute to the speedy accommodation of the dispute. His defence was not deemed sufficient, however, and he was found guilty of treason and remanded to close confinement.

He was also, however, a member of the Provincial Congress, before the bar of which he was arraigned and permitted to make an elaborate defence, reading his letter by paragraphs, and commenting upon and explaining them. His plea was one of the most brilliant and ingenious efforts ever presented in the house. "Confirmed," said he, "in assured innocence, I stand prepared for your keenest searchings." "The warmest bosom here does not flame with a brighter zeal for the security, happiness and liberties of America, than mine."

Nothing that he could say was of avail. The intolerant patriotism of the day, the jealousy and prejudice of the time formed an irresistible current of public opinion, which he was unable to stem. Despite the admittedly insufficient character of the evidence against him, he was convicted and branded as a traitor, although there were not a few among the most respectable and intelligent of the community, who expressed strong doubts of a criminal design in his conduct.

Congress promptly removed him from his office, and changed his confinement at Cambridge to close imprisonment in the jail at Norwich, Connecticut, without the use of pen, ink or paper, no person being allowed to converse with him, except in the presence and hearing of a magistrate of the town, or the sheriff of the county, and in the English language, until further orders from that, or a future Congress. This order was rigorously obeyed for the ensuing seven months, when in May 1776, the health of the prisoner having been greatly undermined by the circumstances attending his imprisonment, he was permitted, at his earnest request, to leave the Country in a merchant vessel bound for the West Indies. From this time, his career is a blank for neither he, nor the vessel on which he embarked, were ever heard from again. His property was confiscated, and any portrait of him which existed was doubtless destroyed, for an extensive search reveals no trace of the survival of anything of the kind, the portrait accompanying this article being an ideal drawn from contemporary description. JAMES EVELYN PILCHER.

## Correspondence.

### THE ORGANIZATION OF THE ARMY MEDICAL DEPARTMENT.

THE following letter of General Sternberg is, with its enclosures, an important contribution to the history of the United States army medical department which the editor is glad to lay before the readers of the JOURNAL.

WASHINGTON, D. C., September 13, 1903.

MY DEAR MAJOR PILCHER :—I send you enclosed copies of a letter and of a draft of a bill which may be of interest to your readers as giving my views with reference to the personal of a Medical Department required for an army of 100,000 enlisted men, under the conditions existing in our service.

Very truly yours,

[Signed] GEO. M. STERNBERG.

WASHINGTON, August 4 1900.

To the ADJUTANT GENERAL OF THE ARMY,

Sir:—In compliance with directions contained in your communication of the 24th ultimo, I have the honor to submit the enclosed draft of a bill for the organization of the Medical Department for an army of 100,000 men, and to submit the following remarks in connection therewith :

The absolute necessity for a largely increased Medical Corps is shown by the fact that we have at the present time in service, in addition to the 192 medical officers of the Regular Army allowed by law, 22 surgeons of Volunteers with the rank of major, 54 regimental surgeons and assistant surgeons of Volunteer regiments, and 501 acting assistant surgeons—a number considerably in excess of the number provided for in the enclosed bill. It will, however, be no disadvantage to have in service a limited number of acting assistant surgeons (contract surgeons), as candidates for appointment to the Regular Corps can be appointed to these positions and it will

enable the Department to ascertain their fitness for service before they are commissioned. In other words, I would have the acting assistant surgeons, as a rule, considered as candidates on probation, to be appointed to the Regular service, after passing a satisfactory examination, when vacancies occur.

In the proposed bill I have changed the nomenclature relating to titles of medical officers. We have at present 6 assistant surgeons general with the rank of colonel, and 10 deputy surgeons general with the rank of lieutenant colonel.

The titles "assistant surgeon general" and "deputy surgeon general" do not in any way apply to the duties of these medical officers and seem to me to be cumbersome and unnecessary.

As regards the titles of non-commissioned officers of the Hospital Corps: Many objections have been raised to the title "hospital steward" and "acting hospital steward," and I think it would be decidedly better to designate the senior non-commissioned officers as "hospital sergeants" and those now called "acting hospital stewards" as "hospital corporals."

I enclose also a copy of a letter addressed by me to the Honorable, the Secretary of War, February 1, 1899, calling attention to the fact that the Medical Corps of the Army was at that time entirely inadequate for an army of 50,000 men. Attention is also invited to enclosed copy of my letter dated November 29, 1899, accompanied by a bill asking for an increase of the Medical Department to correspond with the increase in the number of enlisted men at that time in service. As pointed out in this letter the number asked for in the bill submitted was not at all adequate to the needs of the service and would necessitate the employment of a considerable number of acting assistant surgeons; but it was the minimum number that in my opinion could maintain the medical service of the army in a proper state of efficiency. The present method of depending upon contract surgeons for a greater part of the medical service with troops in garrisons and in the field is expensive and extremely unsatisfactory. A constant stream of physicians employed under contract has been sent to the Philippines to replace those returning. Contracts are made for one year, and it takes on an average six weeks

from the time contract is made before the physician from civil life arrives at his station in the Philippines. At the end of the year, if he so desires, he is entitled to return home, and as there is no prospect of promotion a considerable proportion of those appointed insist upon returning home at the expiration of the period for which the contract was made. Meanwhile they have scarcely had time to familiarize themselves with the important duties of a medical officer aside from those relating to the medical care of the sick. These duties include the sanitary supervision of camps, the care and accountability for Government property, the instruction and discipline of members of the Hospital Corps, the making of prescribed reports and returns, etc. Unfortunately these physicians from civil life, unacquainted with the emergencies of the service, must be sent at once to garrisons, or to duty with troops in the field, where as a rule they are not under the immediate supervision of a trained medical officer who might give them the instruction they so much need. The result is that our troops are being cared for by physicians without knowledge or experience with reference to the special duties pertaining to a medical officer of the army, and that just when they are beginning to acquire this knowledge their services are frequently lost and they must be replaced by other physicians from civil life. I would say, however, that a considerable proportion of the acting assistant surgeons who have been employed are young men of excellent professional attainments, who only lack experience and special training to make them desirable medical officers, and the bill which I submit makes provision for the appointment in the Regular Corps of such acting assistant surgeons as have demonstrated their fitness for the service. Very respectfully,

[Signed] GEO. M. STERNBERG,  
Surgeon General, U.S. Army.

BILL FOR THE INCREASE OF THE MEDICAL DEPARTMENT  
OF THE ARMY.\*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Sec. 1. That on and after the passage of this Act the Medical Corps of the Army shall consist of :

---

\*To correspond with an enlisted strength of 100,000 men.

1 Surgeon General with the rank of Major General.

1 Assistant Surgeon General with rank of Brigadier General.

1 Medical Inspector General with rank of Brigadier General

15 Surgeons with rank of Colonel.

30 Surgeons with rank of Lieutenant Colonel.

150 Surgeons with rank of Major.

300 Assistant Surgeons with rank of 1st Lieutenant for first five years and then with rank of Captain until promoted.

Sec. 2. Hereafter candidates for appointment in the Medical Corps of the Army who pass a medical examining board in compliance with existing regulations, shall be appointed acting assistant surgeons for a probationary period of six months; during this probationary period they shall attend the army medical school established at the army medical museum in the city of Washington, and the faculty of the army medical school shall report to the Secretary of War at the prescribed course of instruction upon the fitness and relative standing of the probationary candidates; those who are recommended by the faculty may then be commissioned by the President to fill existing vacancies in the Medical Corps of the Army.

Sec. 3. Acting assistant surgeons appointed in accordance with the provisions of Section 2 shall be paid \$100.00 per month and shall not be entitled to any allowance or to mileage in reporting for the prescribed course of instruction, or in returning to their homes if they are not recommended for a commission.

Sec. 4. The number of acting assistant surgeons appointed in accordance with the provisions of Section 2 shall exceed the number of vacancies existing or to result from retirements during the probationary period.

Sec. 5. Candidates who have rendered satisfactory service as acting assistant surgeons or as commissioned medical officers in the volunteer army of the United States for a period of six months or more, shall be exempted from this period of probation and may be commissioned at once if vacancies exist and they pass a satisfactory examination as to their physical, moral and professional qualifications.

Sec. 6. Successful candidates who have served as commissioned medical officers of volunteers or as acting assistant surgeons shall be promoted to the grade of captain, after passing a satisfactory examination, at the end of five years service including the time of their service as commissioned medical officers of volunteers or as acting assistant surgeons.

Sec. 7. The age limit for appointment in the Medical Corps of the Army shall be thirty years for those who have had no previous service, but this limit may be extended to thirty-four years for those who have served with credit either as commissioned medical officers of volunteers or as acting assistant surgeons since the 21st of April 1898.

Sec. 8. The Hospital Corps of the Army shall consist of :  
250 Hospital Sergeants, whose pay shall be \$60.00 per month.

50 Pharmacists, whose pay shall be \$50.00 per month and who must be graduates of a reputable school of pharmacy.

400 Hospital Corporals, whose pay shall be \$30.00 per month ; and 4000 Privates of the Hospital Corps, whose pay shall be \$18.00 per month.

All of these enlisted men of the Hospital Corps shall be entitled to rations, clothing allowances, and service pay as now prescribed by law.

Sec. 9. The Female Nurse Corps of the Army shall consist of one superintendent of female nurses, to be appointed by the Secretary of War upon the recommendation of the Surgeon General of the Army, and whose compensation shall be \$120.00 per month ; one chief nurse for every hospital having forty beds or more, whose compensation shall be \$60.00 per month in the United States and \$75.00 per month outside the limits of the United States ; and as many female nurses as may be necessary for service in army hospitals, whose compensation shall be \$40.00 per month in the United States and \$50.00 per month outside the limits of the United States.

Chief nurses and nurses must be graduates of training schools and will be appointed by the Surgeon General under regulations approved by the Secretary of War. They will be provided with rations and quarters, and laundry for their prescribed uniform.

## AN ARMY MEDICAL RESERVE CORPS.

**F**OR the purpose of assisting the Medical Corps of the U. S. Army in time of need, and the patriotic desire to aid our country in the event of war; to stimulate pride and ambition in the military-medical branch of our profession, and to render such assistance as only military-medical training would enable us to give, I have the honor to submit a plan by which I think we could accomplish that end.

First.—All Volunteer and Contract Surgeons of the Spanish-American war, Philippine insurrection and hostilities in China together with National Guard surgeons, between the ages of twenty-five and sixty-four, who have passed, or can pass the examinations, to be appointed and duly commissioned to a reserve list of the Army Medical Department.

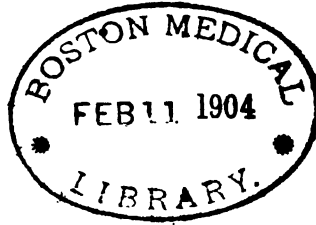
Second.—The rank of all such officers to be determined by age and experience approximately: Officers between the ages of twenty-five and thirty, First Lieutenants; thirty and forty, Captains; forty and fifty, Majors; fifty and sixty, Lieutenant-Colonels; over sixty, Colonels.

In this manner an Army of five hundred thousand or a million men could be provided for, from a medical standpoint, without interfering in the least with the present Medical Corps. In case of war the Regular Army would be enlarged, and Military Hospitals established, and in that way, many officers of the rank of Captain and above, in the Regular branch, would be promoted, leaving vacancies that could be filled, by transfer, from this reserve list.

All officers as above mentioned, to serve without pay unless called into active service. The value of having a large body of trained medical officers at the call of the government at any time cannot be over-estimated. They can be used in times of peace as well as war, to do the work recently done by Contract Surgeons, taking the place of any surgeon at a post in case of absence; examining recruits, etc.,—which would give employment and active training to this corps, that would be of considerable help when called upon in a great emergency.      ARTHUR R. JARRETT.



7408.



## FIRST DRESSING ON THE BATTLEFIELD.\*

BY COLONEL NICHOLAS SENN, M.D., PH. D., LL.D.,  
CHICAGO, ILL.,

SURGEON GENERAL OF ILLINOIS; LIEUTENANT COLONEL AND  
CHIEF OF THE OPERATING STAFF WITH THE ARMY IN THE  
FIELD DURING THE SPANISH-AMERICAN WAR; PRO-  
FESSOR OF SURGERY, RUSH MEDICAL COLLEGE.

"The fate of the wounded rests in the hands of the one who applies the first dressing."—Volkmann.

THE importance of an early efficient dressing in the treatment of accidental wounds is made apparent in the daily observations of the civilian, as well as the military surgeon. The operative work of the former consists largely in dealing with aseptic pathologic conditions, and the results of his experience have made him confident that wound infection rarely occurs if the modern aseptic precautions have been carried into effect, with the necessary thoroughness and skill. He has also learned to appreciate the influence of time in determining infection of accidental wounds. Statistics and his own experience have made him keenly aware of the generally recognized fact that the risk of infection of an accidental wound increases with the length of time that intervenes between the receipt of the injury and the time the first aid is rendered.

The military surgeons who participated in the last two great wars, our Civil War and the Franco-Prussian War, have not forgotten the terrible consequences of infected gunshot wounds, that claimed so many lives and taxed their endurance to its utmost extent. The most insignificant injuries were often followed by the most disastrous complications. Infection was the rule, primary healing the exception. The then known surgical resources proved powerless in preventing suppuration, sepsis, pyemia, erysipelas, hospital gangrene and secondary hemorrhage. Penetrat-

---

\*Presented to the Military Section of the Madrid International Medical Congress.

ing wounds of any of the large joints were, for good reasons, regarded as being beyond the range of successful surgical treatment, and primary amputations and resections, so constantly practiced, only too often failed in saving the patients from the grasp of fatal wound complications. What wonderful changes have been witnessed on the battlefield since that time, as witnessed during the Spanish-American and South African wars! Conservatism has become the rule, mutilating operations the exception. Uncomplicated gunshot wounds, with few exceptions, heal by primary intention under the first aid dressing. Hospital gangrene has disappeared completely; pyemia and erysipelas are seldom seen in tent and hospital. Compound comminuted fractures of large joints under the simplest conservative treatment not only heal in the most satisfactory manner, but in a fair percentage of cases without any material impairment of joint function. What has brought about these striking changes in the results of the practice of the military surgeons on the field of battle? In answering this question, three explanations present themselves:

1. The modifications which the weapon and projectile have undergone since that time. The diminution in the caliber of the bullet, the metallic jacket, the substitution of smokeless for black powder, the greater velocity and power of penetration of the missile, conditions and influences which must necessarily modify the character of wounds inflicted with the modern weapon. The results of a vast amount of experimentations and practical experience have demonstrated conclusively that the jacketed small-caliber bullet inflicts wounds which are practically aseptic, and consequently amenable to successful treatment under the simplest conservative treatment, differing in this respect widely from the large bore leaden bullet, which so often carried before it into the tissues large fragments of clothing and other infected substances.

2. The abandonment of the probe in searching for bullets lodged in the tissues in recent gunshot wounds, formerly so constantly employed for this purpose, and which so often became the direct source of infection. Since military surgeons have learned to regard ordinary gunshot wounds in the light of a *noli me tangere*, one of the most fruitful causes of infection has been eliminated.

3. The use of the first aid dressing applied as soon as possible upon the receipt of the injury. The employment in military practice of the same means and measures calculated to guard against wound infection resorted to in civil practice has contributed not the least in protecting the wounded soldiers against the remote consequences of infection.

It is the purpose of this paper to discuss the last of the contributing causes which have accomplished so much in saving limbs, in minimizing suffering and reducing the mortality of the wounded soldier. In hospital and civil practice the demands made by modern antiseptic and aseptic surgery can usually be met without encountering much difficulty. The treatment of accidental wounds, under these circumstances, is well established, and has been generally adopted with much uniformity in practice. With the exception of gunshot, stab and punctured wounds, some form of disinfection is resorted to for the purpose of eliminating or rendering harmless the cause of infection, so generally present in all open wounds. Drainage is also usually resorted to in such cases, owing to uncertainty of the most vigorous disinfection being successful in effecting the desired object—the transformation of a supposed infected into an aseptic wound. In all cases it is deemed necessary to disinfect the surface of the environment of the wound before the dressing is applied. In military practice, behind the firing line, the necessary conveniences and appliances for primary disinfection are lacking, and in all great engagements the number of wounded is so large that the idea of a preliminary disinfection must necessarily be abandoned. Fortunately it has been found that any efforts in this direction are superfluous. The military surgeon must remain content in exercising all his influence and energy in securing for the wounded protection against infection as soon as possible after the receipt of the injury, and this can only be done by the

#### FIRST AID DRESSING.

The improvements which have been made in the first aid dressing in the treatment of gunshot wounds mark one of the distinct advances in military surgery. The first aid sterile or antiseptic package has, to a large extent, accomplished what others

failed to secure before aseptic and antiseptic surgery came into general use. At the very dawn of modern surgery military surgeons made attempts to utilize antiseptics on the field and in the hospitals. Carbolic acid solutions were employed to some extent by the German surgeons during the Franco-Prussian War, but Billroth's extensive observations in a number of large base hospitals led him to the conviction that they did not exercise any special influence in the prevention of infection.

The terrible experience with gunshot wounds with all the old methods of treatment turned the attention of all military surgeons to the modern treatment of wounds, as soon as it became well established in civil practice. The surgeons in civil life built the bridge across the gap which separated the old from the new methods of wound treatment, and the military surgeons followed the advance columns crossing it, eager and anxious to extend the blessings of the new discovery to the wounded soldier. The first tentative efforts to practice asepsis in military surgery were made during the Russo-Turkish War. Reyher and von Bergmann, who took a conspicuous part during that campaign, were prompt in making known their observations, and their writings laid the foundation for the present rational treatment of gunshot wounds. Two things were brought out clearly during that war, viz: The value of a first aid antiseptic occlusive dressing in the prevention of wound infection, and the importance of immediate immobilization of gunshot fractures. It was during that war, also, that the too common practice of searching for and extracting lodged bullets on the battlefield and in the field hospitals was strongly condemned by both Reyher and von Bergmann. The value and reliability of these observations have been confirmed since that time in a limited way in Bulgaria, Servia, Chili, Greece, Turkey, in small engagements between the British, Italian and French troops and natives, and on a larger scale during the Chino-Japanese, Spanish-American and South African wars. It is evident that aseptic military surgery will never equal in its results aseptic civil surgery, owing to circumstances over which contending armies and military authorities have no control. Military surgery is and always will remain emergency surgery. The difficulty in obtaining and trans-

porting the necessary medical supplies and, in large engagements, the number of wounded, renders it impossible to follow out the necessary aseptic precautions with the same accurate minute detail as is made possible in private and hospital practice. Absolute asepsis in military surgery on the field is out of question, for reasons that have become apparent to anyone who has taken part during an active campaign.

In the treatment of the wounded, the first duty of the military surgeon at the front consists in protecting as many wounds as possible, and in the shortest space of time against subsequent infection, and this can only be accomplished by the first aid dressing, which meets all essential requirements, if properly applied. It is interesting to know what has been done in the way of recommendation for asepsis on the battlefield. Antiseptic powders and pastes, sterile and medicated cotton, gauze, wood wool and other hygroscopic substances have been proposed. As antiseptics, iodoform, airol, salicylic, boric and carbolic acid, mercuric chlorid, zinc chlorid and salol have been most frequently mentioned and used.

Patin suggested the following first aid package : One elastic bandage; one antiseptic gauze bandage ; two graduated compresses of the same material enclosed first in the paraffin paper, and, as a cover, strong paper made water-proof by linseed oil and a siccator. Bedoin proposed as a dressing material for first aid, filtering paper sterilized by dry heat and immersion in a 1-1000 bichlorid solution, to which a little glycerin is added, when the paper is slowly dried. Six to eight layers are applied over the wound, besides cotton, and the dressing held in place by a bandage. The package which he recommends for field service contains six sheets of antiseptic filtering paper, 40 centimeters square, properly folded ; a piece of gutta percha tissue, 45 centimeters square, in which the paper is wrapped; a thin rubber bandage, from one to 1.5 meters in length, and several safety-pins. The package weighs 40 grams.

Forgue recommends iodoform and cotton as an exclusive dressing. The first aid package in use in the French army a few years ago is quadrangular in shape, the grey cloth wrapper bearing on one side printed directions for use. It is opened by extract-

ing the thread used in sewing the wrapper. It contains one impermeable fabric; a small cushion of sublimated jute; a sublimated gauze compress and bandage, and two safety-pins.

Von Mosetig-Moorhof advises dusting of the wound with iodoform, over which a gauze compress is applied, then mackintosh or some other impermeable material, which is made to overlap the gauze for at least one inch, and over this a large absorbent dressing and bandage.

Wein recommends iodoform gauze between two layers of absorbent cotton wrapped in gutta percha tissue in a compact package. Before applying the dressing, it is to be immersed in a strong solution of mercuric chlorid, or a carbolized solution, to insure absolute asepticity, when the iodoform gauze is applied next to the wound, and over it the cotton, gutta percha and lastly the retaining bandage.

In 1869 von Esmarch devised the triangular bandage, with printed directions for its use as a component part of the first aid package. His typical first aid dressing consists, besides this bandage, of two compresses of sublimated gauze, 10 centimeters broad, and 100 centimeters long, each wrapped in waxed paper, and an antiseptic bandage, 10 centimeters wide and two meters long. The whole package, in rubber cloth, weighs 100 grams.

According to Seydl, the first aid dressing in use in the German army in 1893, contained a sublimate gauze bandage, 5 meters in length; two compresses of the same material; one safety-pin, the whole wrapped in a compact form in water-proof linen cloth, which is sewed into the skirt of the uniform of officers and men.

In 1891 the following first aid package was adopted by the English army: Within an outer grey fine linen cover is a thin water-proof cambric inside cover, which is rendered air-tight by being cemented at the edges. Both covers can be readily opened when necessary. The inner cover contains two safety-pins; a piece of water-proof cambric, 12 inches by 6 inches, and this encloses a gauze bandage,  $4\frac{1}{2}$  yards long, folded flat into a package, 4 inches by  $2\frac{1}{2}$  inches; a piece of gauze, 17 inches by 13 inches, also folded flat, and about 160 grains of compressed flax charpie between two layers of gauze. All the dressing materials

are rendered antiseptic by impregnation with mercuric chlorid solution, 1-1000. The weight of the complete dressing is two ounces. This package was in use during the South African War (Makins).

During the Spanish-American War the Surgeon-General issued 270,000 first aid packages to the troops in Cuba and Porto Rico; and the soldiers in the home camps. Two kinds of packages were used. The one in pale red cover contained two antiseptic compresses of sublimated gauze in oiled paper; one sublimated cambric bandage, with safety-pin; one triangular Esmarch bandage, with safety-pin. Directions printed on package: "Place one of the compresses on the wound, removing the oiled paper. In cases of large wounds, open the compress and cover the whole wound, then use triangular bandage, as shown by illustration on the same." The other package, in yellow cover, contained the same materials and directions, but was different in shape, somewhat larger, narrower and thicker.

During the war with Spain, I devised and issued to the Illinois troops 10,000 first aid packages, which were made up as follows: Two pieces of lintin, a form of compressed cotton, 4 inches wide and 16 inches long, sterilized and folded twice lengthwise; half a drachm of boro-salicylic powder (4:1), in a small waxed aseptic paper envelope; between them a piece of sterile gauze, 44 inches square, with two safety-pins, folded to correspond in size with the lintin compress; all of these articles wrapped in tin-foil; 2 strips of rubber adhesive plaster, one inch wide and 8 inches long, the whole sewed in an impermeable canvas or linen cover. One of these packages was sewed into the skirt of the uniform on the left side of each soldier.

All of the first aid packages which have been described, including those furnished our own army, are too bulky for first aid dressing in the field. The packages used during the Spanish-American War did excellent service in the field hospitals, but there is no place in the uniform of the soldier where they would be tolerated for any length of time for the purpose for which they are intended.

Longmore makes the statement that during the Egyptian campaign the first aid packages issued to the troops were used for almost everything else except as a dressing for wounds.

Two of the first requirements of the first aid package to be acceptable to the soldier, and to be tolerated on his person, must always be minimum size and weight.

Kölliker describes one of the simplest dressings for recent gunshot wounds. It consists of an aseptic mull bandage, 5 meters long and 8 centimeters wide, the beginning end of which is impregnated with iodoform, so that this part of the bandage can be folded and used as a compress with which to cover the wound, and the bandage as a fixation bandage. Gutta serena tissue can be included in the bandage with which to cover the compress. The bandage is made up in a package, enclosed in a water-tight cover, and weighs only 15 grams. In applying the bandage, the iodoformized part can be cut off and applied separately over the wound; or it is simply folded over the wound before the roller part is applied.

The value of the first aid dressing as a protection against infection of recent gunshot wounds was well demonstrated during the Spanish-American War. As a rule, the wounded received early attention, and in very few cases infection occurred in case the dressing was properly applied and remained undisturbed. The same favorable results followed its use during the South African War. Makins, the author of "A Civilian War Hospital," states: "With regard to the early application of the first field dressing, it is to be noted that this was most commonly applied within a very short time of the receipt of the wound; and it is certain that much good must have resulted therefrom. It was easy to find out that the men themselves very thoroughly appreciated the necessity of using the dressings, and we could quote innumerable instances of men binding up each other's wounds when the skilled assistance of surgeons or orderlies was not at hand. It was seldom that the dressing was not applied within half an hour of the receipt of the wound." The dressing which appears to have been used largely consisted of a bandage, two safety-pins, gauze, wool, and a piece of jaconet, the whole done up in a small mackintosh bag with a linen cover, on which were printed directions.



We will now consider the most important points concerning the make-up of the first aid package. It has already been stated that the package should be as small and light as possible, so that it will cause no extra burden or mentionable inconvenience to its bearer, the soldier. Large packages of any kind will never prove satisfactory as a first dressing in the field. The first aid package for field use must meet the following requirements :

1. It must be simple in its construction, in order that it may be applied efficiently by unskilled hands, and with the least possible delay.
2. The dressing material employed must not interfere with the free evaporation of the wound secretion
3. The dressing material must be hygroscopic and not only aseptic, but antiseptic.
4. The antiseptic used must be non-volatile and resistant to chemical changes for a long time.
5. It must contain a fixation material which will prevent displacement of the dressing after it has been applied.
6. All dressing materials must be kept ready for use in a water-proof cover.

1. It will be shown further on that the first aid dressing in all great engagements of the future will necessarily be applied by the wounded themselves, their comrades, or by trained litter-bearers and other members of the Sanitary Corps, as the limited number of surgeons in the front will be entirely inadequate to render the large number of wounded the necessary timely assistance. This fact alone is sufficient to prove the necessity of the simplest make-up of the dressing. It must also be remembered that these dressings, intended for the field, are to be applied in the heat of battle, where conditions are such that the mind is pre-occupied, and, hence, unless the dressing is of the simplest kind, mistakes in its application are very likely to occur. Printed directions on the outside of the cover are valuable aids for instruction in camp and tent, but of no practical value when a knowledge of the proper manner of application of the dressing is most needed. Loose articles in the package, such as envelopes, enclosing the antiseptic, safety-pins, strips of adhesive plaster and

handkerchief, are very liable to be dropped when the package is opened in haste, in which event such articles, when used, may become a source of infection. The dressing and retaining bandage should be connected or separable without the use of cutting instruments. The ordinary aseptic gauze roller should take the place of the triangular bandage so frequently found as the most conspicuous component part of first aid dressings.

2. Suturing and sealing of gunshot wounds has not yielded the expected immunity against infection entertained by those who advocated this practice. This method of treatment was first suggested by a surgeon of the Confederate Army during the Civil War, and was revived by Langenbuch, who advocated strongly the closure and sealing of the wounds by suturing and adhesive plaster, a part of the field service he wished to delegate to the litter-bearers.

Port modified the recommendations of Langenbuch in so far that he applied the adhesive plaster in the form of a Maltese cross, with a central opening, which, when the plaster is in place, is covered with iodoform gauze and cotton, for the purpose of guarding against retention of wound secretions. The margins of the gauze dressing are sealed to the surface with a rubber solution, and the whole retained by strips of adhesive plaster. So-called primary occlusive dressings, made so by applying over the absorbent material an impermeable cover of gutta percha tissue, oiled silk, waxed paper, silk, zinc-foil, protective rubber or mackintosh cloth, have likewise not stood the test of time and a large experience. *All attempts to exclude the atmospheric air from the dressing in contact with the wound prevent evaporation of the wound secretion, maintain heat and moisture in the dressing, and, by doing so, create a condition most favorable to the growth of pathogenic microbes, which are never absent in the immediate vicinity of the wound on the surface of the skin.* The dressing material should always be dry, and should remain so, in order to favor the desiccation of the blood absorbed by the dressing. A dry crust, formed by the desiccated blood and the hygroscopic material by which it has been absorbed, constitutes the most efficient occlusive dressing.

3. ' In view of the well established fact that the surface of the skin underneath the dressing is always inhabited by pathogenic microbes in great numbers, it must appear rational to insist, in a most emphatic manner, upon the necessity of employing for the dressing material that is not only aseptic, but antiseptic, rendered so by impregnating it with some reliable fixed antiseptic substance. Contamination of material well protected by a waterproof cover is not very likely to occur, even when carried for a long time upon the body of a soldier in active service.

Lühe made a bacteriologic examination of the contents of the first aid packages of a troop of soldiers who had carried them in the skirt of their uniform during an entire summer, while on constant duty, and found them absolutely sterile. A very interesting and practical article on the comparative protective effect of antiseptic and aseptic dressings applied to the surface of the skin will be found in "*Der Militärarzt*," 1895, No. 15-20, by Bogdan. (*Untersuchungen über den ersten Verband*). This writer made a bacteriologic examination of the skin of soldiers in active service, to determine the kind and number of microbes with which it is inhabited. Within an area of five centimeters of surface he estimated the number of microbes at 4,429. The wearing apparel is infected to about the same degree. He then covered an area of the same size with an aseptic dressing and a similar one with a 1-1000 bichlorid gauze, to ascertain the fate of the microbes under the two different kinds of dressings. Twenty-two such experiments were made. At the end of twenty-four hours he found under the aseptic dressing 780,729 germs, and under the sublimate dressing only 19,668, showing conclusively that the antiseptic dressing exerted a decided influence in inhibiting the growth of bacteria.

4. The selection of an efficient, durable antiseptic for the dressing is a matter of great importance. Various substances have been suggested and tried. Carbofic acid is volatile, and it is not adapted for dressings in the field. Mercuric bichlorid has enjoyed the greatest popularity, but it is a very fickle chemical substance, prone to decomposition by chemical changes which destroy its antiseptic properties, when incorporated in dry dressing

material. For the purpose of guarding against such changes and fixing the antiseptic more permanently to the dressing material, Majewski recommends a dressing of 25 per cent. Hg. 100.0, vaselin gauze, and insists that the first dressing should not be removed in less than a week. Iodoform does not possess any decided antiseptic properties, and cannot be relied upon in the protection of recent wounds against infection. It was very extensively used in the field on the occasion of the Egyptian campaign of 1882, but it did not prevent copious suppuration in a large proportion of the wounded treated by it. Its use, however, is sanctioned at the present time by the highest authorities, including von Bergmann, Constans, von Mosetig-Moorhof, Fränkel and Pfuhl. The iodine is liberated from it in a comparatively short time, and with the loss of this, the most important antiseptic constituent, the drug becomes almost inert, as far as its bactericide action is concerned. The persistent odor is another serious objection to its use.

Credè recommends itrol (citrate of silver) and actol (lactate of silver), the former in powder form, the latter in solution. Salicylic acid was introduced into practice as an antiseptic by the late Professor Thiersch, and von Esmarch called special attention to this agent as an antiseptic for field dressings. He proposed the use of salicylized cotton charpie and gauze as the most desirable material for the dressing.

Boracic acid is another stable and valuable antiseptic, but cannot be relied upon in a small dressing in preventing wound infection. It has recently been proposed to carry the antiseptic in the form of a paste, in a collapsible tube, and apply it directly to the wound.

Von Bruns recommends a paste containing xeroform and kaolin. This paste is made according to the following formula: Xeroform, 10.0; kaolin, 45.0; mucil. gummi., 20.0; glycerin, 25.0 q. s. ut ft. pasta mollis. The paste, in a zinc collapsible tube, is to be carried by those who apply the dressing, while the remaining material is to be supplied by the package on the person of the wounded soldier.

Mr. Chratté (*A First Aid Dressing*; *British Medical Journal*,

1900, Vol. II, p. 668) used a paste made in the following proportions :

Mercury and zinc cyanide	-	-	-	-	gr. 400
Tragacanth in powder	-	-	-	-	gr. 1
Carbolic acid	-	-	-	-	grs. 40
Sterilized water	-	-	-	-	grs. 800

—to be carried in a collapsible tube; sufficient bicyanide gauze and wool for the dressing of two wounds; a bandage, and four safety-pins; the whole enclosed in a mackintosh bag.

The objections to a field dressing of this kind are very obvious. The collapsible tubes are easily broken; the application of the paste to the wound is not free from risk of infection, and the method lacks simplicity, one of the most essential features of an efficient practical field dressing. For a number of years I have relied on a combination of salicylic and boracic acids as an antiseptic in powder form for field dressings. The combination is in the proportion of 4:1 in weight. The ingredients of the mixture should be thoroughly triturated into an impalpable powder, which is incorporated in the dry dressing material at a point corresponding with the location of the wound. It is absolutely necessary, for the purpose of rendering the dressing efficient, and with a view of eliminating risk of additional infection during its application, not to separate the antiseptic from the dressing material. As an absorbent cover for the wound, absorbent cotton is superior to gauze, as it constitutes a more effective filter, and with the extravasated blood and wound secretion, on their desiccation, forms a firmer and more durable protective crust. The primary wound secretion dissolves a part of the powder contained in the dressing material, and the resulting antiseptic fluid resembles in its effects very closely Thiersch's solution, which has, for good reasons, become very popular as a safe, non-irritating and yet very efficient antiseptic. The borosalicylic powder does not irritate the skin, and even if applied in full strength directly to the wound the smarting which is caused at first subsides in a very short time. The powder is non-toxic, odorless and retains its potent antiseptic properties for an indefinite period of time. Its antiseptic qualities have been tested on a very large scale, in civil as well as military practice.

5. The triangular bandage of von Esmarch and the ordinary roller bandage cannot be relied upon in preventing the displacement of the dressing. The first aid dressing accomplishes what we have a right to expect from it only if it is kept in uninterrupted contact with the wound until it has become superfluous as a protection against infection, that is, until the wound is healed.

During the Spanish-American War we had ample opportunity to satisfy ourselves of the necessity of a means of direct fixation of the dressing as an essential component part of the first aid package. Many of the dressings became displaced before the

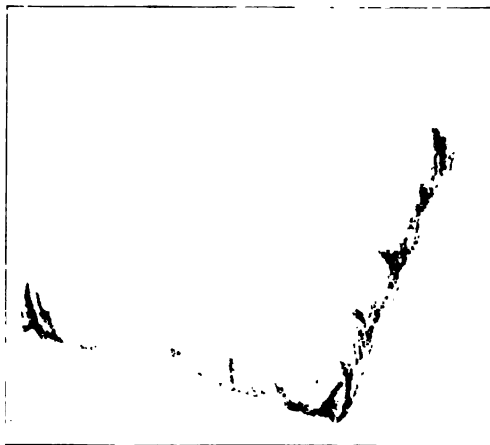


Fig. 1. First Aid Package in Water-proof Cover.

wounded reached the field hospitals, and in consequence of this post-injury infection could often be traced to this cause. The only available material for direct fixation of the dressing, and that can be readily made a part of the first aid package, is rubber adhesive plaster. The adhesive plaster of American manufacture enjoys all over the world an enviable

and well merited reputation. One, or still better, two adhesive plaster strips, an inch wide, and twice the width of the wound dressing, should be incorporated among the contents of the package. All kinds of adhesive fluid material for fixation purposes are, for very obvious reasons, decidedly objectionable.

6. Various materials have been used for the safe-keeping of the dressing material, such as tin-foil, waxed and paraffin paper, gutta percha tissue, mackintosh, water-proof, linen and canvas, oil cloth, pure rubber sheeting, and metallic cases. For the outer cover, some kind of durable water-proof fabric deserves the pref-

erence Glass or metallic cases would be very desirable, but the former would be too fragile, and both sorts too expensive, and too unyielding and heavy. Fine paraffine paper for the inner, and water-proof linen for the outer cover, possess the most desirable qualities for general use.

THE AUTHOR'S FIRST AID  
PACKAGE.

After quite varied observations and experiences during the Greco-Turkish and Spanish-American War, the author has reached definite conclusions in reference to what a field dressing should contain, and what may be expected from it by a timely resort to its use in the field. As has been emphasized before, it must be as light and as small in size as possible, simple in its make-up, and application, and yet it must contain everything essential to protect the wound against subsequent infection. I recommend the employment of the boro-salicylic powder, 4:1, as the antiseptic to be relied upon; a sterile gauze bandage, 4 inches wide and two yards in length; a compress of sterile absorbent compressed cotton, four inches by

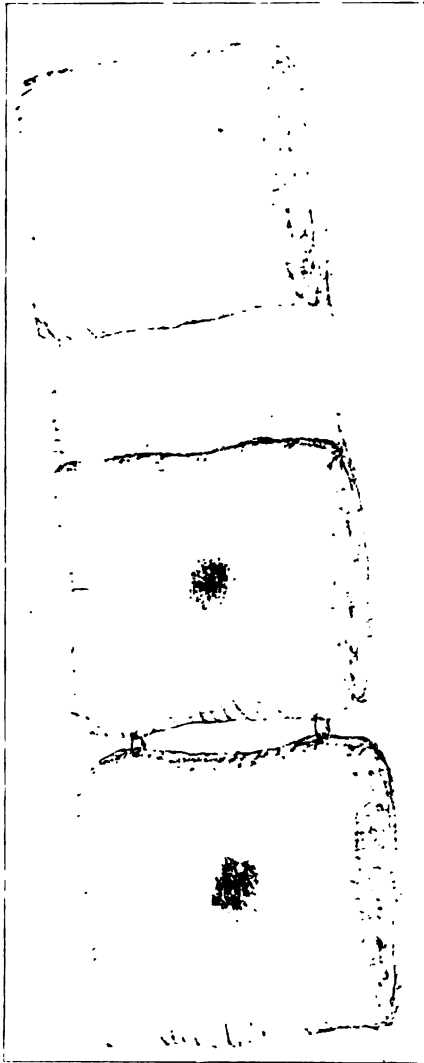


Fig. 2. Two Dressings of First Aid Package showing Surface to be applied to Wound, and Gauze Roller.

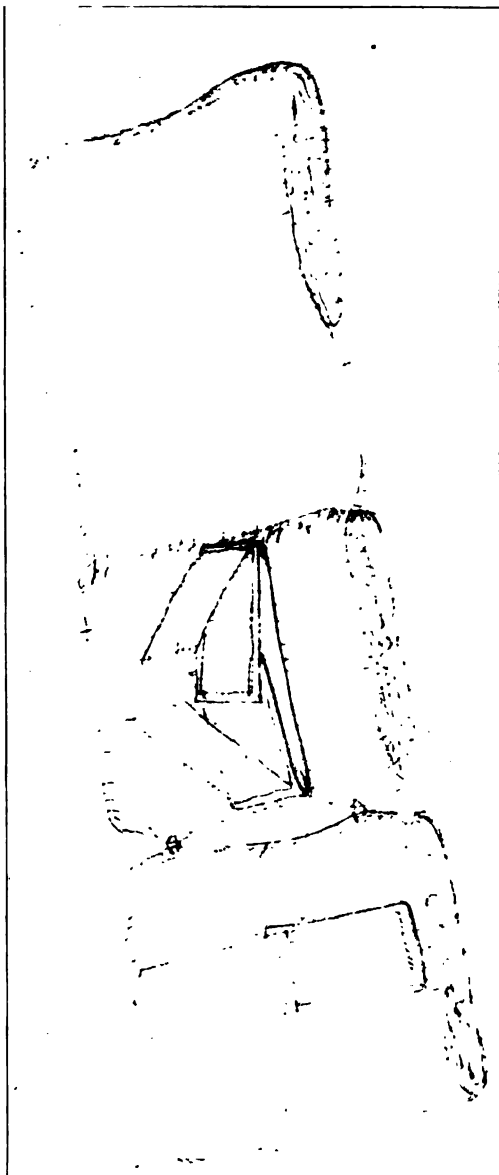
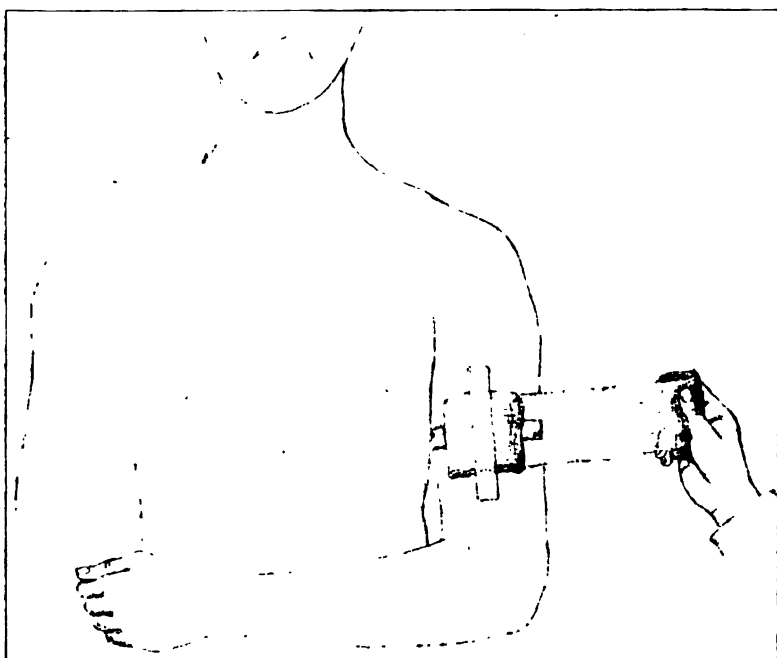


Fig. 3. Dressings with Strip of Adhesive Plaster fastened to outer surface.

four inches; two safety-pins and a double envelope, the inner of fine paraffin paper, the outer of waterproof linen, upon one side of which the directions for the application are printed; a second similar dressing attached to the first by two loose stitches of sterile cotton threads and two strips of adhesive plaster for each dressing, an inch wide and eight inches long. Half a drachm of boro-salicylic powder is incorporated in the center of the cotton compress and its location marked on the inner side of the gauze cover with tincture of iodine, the mark corresponding in size with the average opening of an ordinary bullet wound. It is this brown spot which indicates the location of the antiseptic powder, and how and where the compress should be applied. The first cotton compress is rolled



once or twice in the beginning end of the gauze bandage, and unfolding prevented by two marginal stitches of aseptic thread. The adhesive plaster strips are fastened to the outer side of the compress, with the free ends covered by the attached cloth reflected over the attached part. The second compress is made up in a similar manner and attached to the first one by two aseptic loose cotton thread stitches. The two compresses are laid against each other with the



**Fig. 4. Dressings applied to Gunshot Wound of Arm, fastened in place with Two Strips of Adhesive Plaster.**

adhesive strips on opposite sides, and wrapped up neatly in the balance of the bandage, to the distal end of which two safety-pins are fastened. If the package is used in dressing a single wound, both compresses are applied over it with the brown spots in the direction of the wound and the adhesive strips in opposite direction, and the roller bandage applied over them and fastened with the safety-

pins. If two wounds are to be dressed, the second compress is separated from the first by tearing the threads connecting them, and applied over the second wound, and both of them fastened with the plaster strips and included in the same roller, or, if the wounds are too far apart, the bandage is cut at the desired point and each part applied separately, in which event the fastening

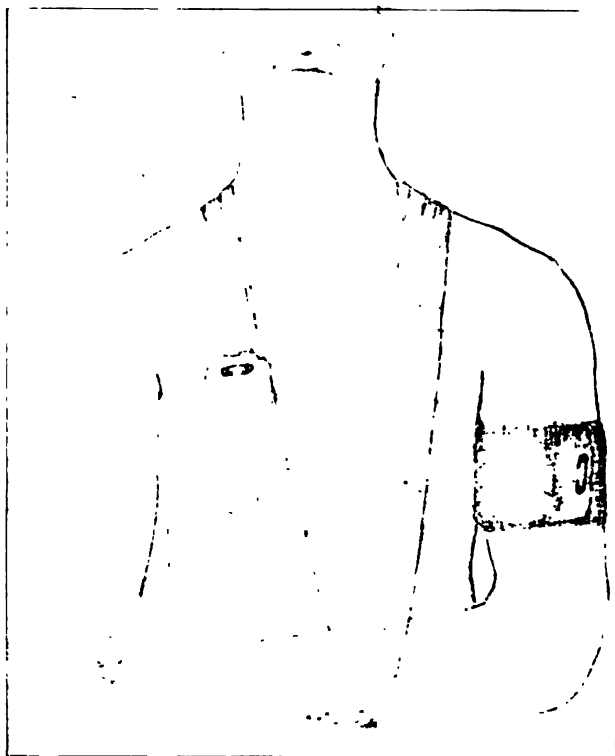


Fig. 5. Dressing Completed. Part of Bandage used for a Sling.

must be done with one safety-pin. In special cases the surplus part of the bandage can be utilized for a sling, or in the application of extemporized fixation dressings. No unnecessary handling of the material is required in the application of this dressing, and the procedure is so simple that the average soldier will comprehend

it almost instinctively, and can make intelligent use of it whenever emergency calls for it.

#### UTILITY OF THE FIRST AID DRESSING IN WAR.

The claim has repeatedly been made that inasmuch as the bacteriologic researches have shown that all of the gunshot wounds are infected more or less, the first aid dressing can lay no claim to preventing the usual number of septic complications. From a practical standpoint, scientific investigations are in conflict with the results of actual experience, as the latter has demonstrated with sufficient clearness that recent wounds inflicted by the small bore bullet although always infected are practically aseptic, and remain so under the protective antiseptic dressing. Disinfection of the bullet does not take place by the firing of the missile, as the experiments of Messner, La Garde, Habart and Faulhaber have

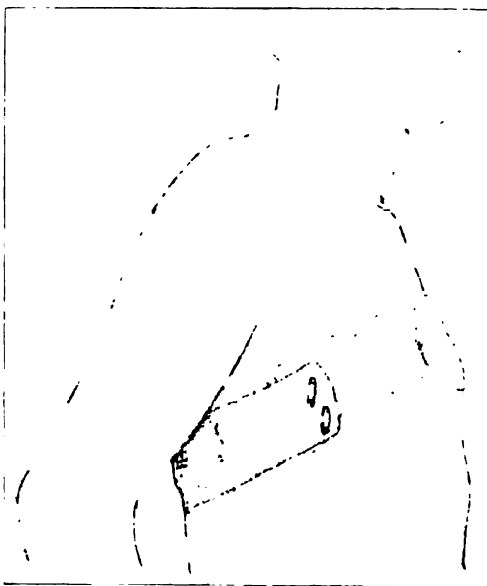


Fig. 6. Package used in Dressing Two Gunshot Wounds of the Chest.

demonstrated conclusively that artificially infected projectiles infect the wound without exception. The danger of infection increases with the size of the wound. The wound of exit is with few exceptions always larger than the wound of entrance and very much so if the bullet in passing through the tissues has penetrated the shaft of any of the long bones and if fired at a range of less than 1000 yards in which event the fragments of bone and

soft tissues carried before the missile greatly increased the zone of tearing and contusion. It occasionally happens that in the neighborhood of a large wound of exit smaller wounds are found made by splinters of bone or fragments of the bullet or its shattered metallic mantle. Such wounds require special attention in the application of the first dressing in order to cover the wounded surface entire. On the other hand, Fränkel and Pfuhl imbedded fragments of worn clothing in the tissues and concluded from the results of their experiments that such fragments, when not artificially infected, behaved indifferently in the tissues. Quite an extensive military experience has been the means of settling a number of points in reference to infection of gunshot wounds, and these are :

1. The larger the wound, the greater the risk of infection.
2. Bullets that strike the ground before entering the tissues are more likely to cause infection than bullets fired directly at the living target.
3. The small-caliber, jacketed bullet does not carry with it foreign infected substances as frequently and to the same extent as the leaden bullet. Wounds in naval warfare and wounds inflicted by missiles of large caliber, fragments of shells and shrapnel, are, in the great majority of cases, infected wounds, and must be treated as such. Nearly all wounds of the marines on the Japanese men-of-war, engaged in battle on the Yellow Sea during the war of Japan with China, were infected and suppurated, notwithstanding the usual antiseptic treatment was promptly applied. Küttner, who was one of the representatives of the German Red Cross Society in South Africa, attributed the good results to the small-caliber bullet and improved treatment. Wounds made by leaden bullets were frequently infected. All shell wounds were infected, and 42 per cent. of the shrapnel wounds, while only 12 per cent. of the wounds inflicted by the small-caliber, jacketed bullet became infected. As the result of his personal observations in Turkey and Africa, he has become firmly convinced of the utility of the early first aid dressing as a reliable means of diminishing the frequency of infection. Large gunshot wounds are so frequently infected, owing to the great

likelihood of the missile carrying into the wound foreign substances charged with infective material, and also by the more extensive contusion produced by the large as compared with small projectiles.

Karlinski made experiments which prove that the small-caliber bullet, in passing through clothing, carries with it only minute particles of the fabric. He covered tin boxes, filled with an aseptic solid nutrient medium, with cloth of uniforms that had done active service, and fired bullets through them. The nutrient medium was invariably infected by the foreign particles of clothing. He also made experiments on rabbits covered with cloth of worn uniforms, and the results were the same. It must be conceded, from these and other experiments, that no gunshot wound is entirely aseptic, but in the vast majority of cases the infection is not of sufficient intensity to interfere with ideal healing of the wound, provided further infection is prevented by the antiseptic protective dressing. In modern warfare many wounds will be made by ricochet bullets. An unexpected number of such wounds came under our observation after the battle of San Juan Hill, Cuba. It became very evident later that these wounds were infected with much greater frequency than wounds made by direct bullets. Many of those bullets lodged in the tissues, and on extraction were usually found much deformed. The deformation of the bullet not only increases the size of the wound, but in striking the ground the ragged edges serve as receivers for foreign infected substances—earth, bark of trees, clothing, etc.

It is the clean wounds, inflicted by the non-deformed, direct bullet of small caliber that heal so constantly and speedily under the first aid dressing, in the absence of grave visceral complications. Let us hear the opinions of two experienced military surgeons on the utility of the first dressing on the battlefield.

Sir William MacCormac said, in 1895: "Some form of antiseptic occlusive dressing will prove most generally applicable. The small wounds of entrance and exit render this plan comparatively easy and lessen considerably the dangers of infection." The distinguished Professor von Bergmann laid the foundation of modern military surgery during his service in the Russo-Turk-

ish War. He began his work upon the supposition that all gunshot wounds were infected wounds. He disinfected, drained and dressed antiseptically, but the results disappointed his sanguine expectations. He found it necessary to make a radical change in the treatment. He abandoned all efforts at disinfection, ceased to drain, did not touch the wound, applied an antiseptic dressing, in the form of a cotton compress saturated with alcohol, and was astonished at the unexpected, never-heard-of results. The results were most favorable when the antiseptic dressing was applied as soon as possible after the injury occurred. Of fifteen gunshot wounds of the knee joint, fourteen recovered, and in eight of these the wound healed by primary intention, a triumph on the battlefield never equalled before.

The surgical records of the Spanish-American War will bear testimony to the life and limb-saving utility of the first dressing behind the fighting line. The same can be said of the South African War, where the first dressing was almost always applied on the battlefield, and seldom removed at the first dressing station. At Magersfontein five hundred wounded were dressed on the field, and transported to the rear during the heat of battle, exposed at the distance of a mile to the fire of the enemy, with results that will always be a credit to the medical service of the British army.

These experiences can leave no further doubt as to the necessity of extending the humane functions of medical officers and litter-bearers to the very firing line, in order to bring to the wounded all of the benefits of modern military surgery. This leads us to ask,

#### WHO SHALL APPLY THE FIRST DRESSING?

On this subject, the views of military surgeons are by no means settled; in fact, opinions are diametrically opposed. We have already furnished substantial proof of the early first aid dressing as a prophylactic against subsequent infection of the wound, and clinical experience in the field has likewise demonstrated that the sooner such aid is rendered, the better are the results. The next question which arises is, Where and by whom shall the first aid dressing be applied? There are authorities who claim that no one but medical officers should be entrusted with

this work. Tiroch, a military surgeon of thirty years' experience, has come to the conclusion that the first aid dressing should invariably be applied by the military surgeon, and never by litter-bearers, or other members of the Hospital Corps. He insists that the duty of the latter should be an exclusive one, limited to the transportation of the wounded out of range of fire at the earliest possible moment, where the surgeons are to apply the dressing. He has no use for the first aid package, and insists that the dressing of wounds by anyone except surgeons is useless and often fraught with danger. Longmore, W. Roth, Wein and other seasoned military surgeons are of the opinion that the first duty of the medical officers, when in action at the front, consists in concentrating their energies upon providing for a speedy removal of the wounded from the firing line to a place of safety. It is their belief that little or nothing can be done in the way of treating wounds successfully until this has been accomplished. No less an authority than von Bergmann is of the opinion that nothing is lost by deferring the first aid dressing for 6-8 hours and that much may be gained by the escape of blood from the wound in washing out bacteria. He is in favor of applying the first dressing at the receiving station. Many military surgeons have expressed themselves as being opposed to the employment of the first aid package by anyone else except medical men. This position will be untenable and dangerous during any great war, when the number of wounded will greatly exceed the working capacity of the limited number of surgeons at the front.

In this respect, let us look back and study the figures of

#### THE WOUNDED IN WAR.

Crimean, 1854-56,	English, 12,094
In Italy, 1859-60,	French, 17,054
American Civil, 1861-65,	Federals, 246,712
Prussia-Denmark, 1864,	Prussians, 2,962
Austria-Prussia, 1866,	Prussians, 1,455
France-Germany, 1870-71,	Germans, 99,566
Russia-Turkey, 1877-78,	Russians, 56,652
China-Japan,	Japanese, 1,105
Indian frontier, Terah Exp., 1897-98,	English, 948
Spanish-American, 1898,	Americans, 1,594

## NUMBER OF WOUNDED IN GREAT BATTLES IN THE PAST.

Battle of Inkermann,	Russians, 9,406
	French and English, 13,709
Battle of Gettysburg,	Federals, 13,709
	Confederates, 14,500
Battle of Sedan,	French, 14,000
	Germans, 6,483

Under the fire of a French Brigade at St. Privat 6,000 officers and men of the Prussian Guard, or a third of their total number, were killed or wounded in ten minutes at a distance of 1,500 yards, during the Franco-Prussian War. During the Russo-Turkish War the Russians in many instances suffered losses from aimless fire at 3,000 yards, while instances occurred not infrequently of divisions of 10,000 men losing half their number at one mile from the enemy. The few figures above quoted cannot fail to convince those who are placed in charge of the wounded of the utter impossibility of rendering timely aid if this function should be limited to medical officers only. The large battles of the future will be fought at greater distances than in the past, and will cover a much larger territory,—another important argument in favor of a larger force of non-combatants, trained for the first aid work. But in battles of the magnitude cited above, even the duplication of the number of the members of the Sanitary Corps as it exists at the present time would not suffice in discharging the duties which the countries of the contending armies owe to the wounded. The soldier has a right to expect to receive assistance and proper care the moment he is disabled, be this in camp, on the march, or in the firing line. When a soldier is struck down by a bullet in the discharge of his duty, he is no longer a combatant, and has a claim on humanity which no nation can ignore. The soldier in active service is less in fear of the enemy's bullets than the dread of uncertainty of his fate if a bullet aimed at him should fail to extinguish life.

The rapid march of civilization all over the world is destined to make war more and more humane. The height of humanity in warfare will be reached when every soldier can carry the conviction with him to the front that the moment he is wounded, he



will receive by his own efforts, or by assistance within easy reach, the essential benefits of modern surgery.

Three things are necessary for the desired betterment of field surgery;

1. The first aid dressing must be one that will insure further infection of the wound impossible, and so simple in its make-up that it can be applied intelligently by every soldier.

2. Not only the men of the Hospital Corps, but every soldier, should be instructed in the elements of first aid work before he is called upon to enter an active campaign.

3. The line officers must be in harmony with the medical staff in the promotion of first aid dressing.

During the Cuban campaign the dense jungle often prevented the ready location of the wounded by the surgeons and men of the Hospital Corps, and in many instances the first aid dressings were applied by the wounded themselves, or by their comrades, using the first aid package supplied each soldier. In many cases the first aid dressing was never removed until about the tenth day, when the wounds were found permanently healed. Suppuration occurred in less than five per cent. of the wounded. (Borden.)

With such and similar experiences elsewhere we certainly must come to the conclusion that the first aid dressing has become an absolute necessity on the battlefield, and that, instead of being a menace to the wounds, it has accomplished much in diminishing infection, and promises much more in the future, with the improvements of the first aid package and the better understanding of its objects and application by the soldiers, from the commanding general down to the private. A general diffusion of an intelligent knowledge of the purpose and the effective application is the only way in which the wounded can be reached in time, their sufferings alleviated and their injuries protected against the disastrous consequences of subsequent infection. The sooner the mass of military surgeons can be made to cooperate their energies in this direction, the sooner the ideals of human warfare will become a reality. No government will ever call into service a sufficient number of specially trained surgeons to meet the emergencies at a time when first aid is most needed, and where it will yield the surest and best results.

## APPLICATION OF FIRST AID DRESSING.

It is now generally conceded that all attempts at preliminary surface disinfection are not only superfluous and useless, but as experience has amply demonstrated, it increases the danger of infection in all recent gunshot wounds. The wound is not to be touched, under any circumstances, as the undisinfected finger is a much more dangerous implement of infection than the bullet itself. The antiseptic dressing is applied to the wound as it is found. If modern surgery condemns the touching of the wound with the finger, it prohibits with even more emphatic language the use of the probe. In dressing wounds of the hairy scalp, the hair is parted without touching the wound, before the compress is applied. The centre of the compress, marked by the brown spot, is applied over the perforation, the compress fastened with adhesive plaster, and the roller bandage applied over it. If the injured part can be readily exposed, this should be done. It the contrary is the case, more especially in cold weather, it is much better to gain access to the wound by slitting an opening in the clothing with a knife, apply the compress, fasten it in place with the adhesive strips, and apply the gauze roller bandage over the clothing.

## ARREST OF PRIMARY HEMORRHAGE.

The treatment of internal hemorrhage by opening any of the large cavities of the body, desirable as it might appear under other circumstances, is not to be considered for a moment outside the field hospital. Something must be said here in connection with the use of the first aid dressing, in reference to the management of external hemorrhage. I fear the employment of elastic constriction has been championed with too much enthusiasm. Let us see what we have learned in reference to hemorrhage from bullet wounds as a cause of death. Among the 253,142 recorded gunshot injuries of the Civil War, death from primary hemorrhage was very rare. Of 58,702 of flesh wounds of the limbs, large vessels were injured only in 156. Ligation of large vessels made necessary by flesh wounds was performed only 195 times.

Praetorius collected 498 cases of gunshot injury of the large vessels of the extremities from the statistics of gunshot wounds of the Franco-Prussian War. In 393 of these cases primary

bleeding occurred in 274, while of the remaining 219 some of them belonged to this category, but in the larger number of them the hemorrhage was secondary. In all, 113 cases of grave primary hemorrhage are mentioned.

The experiments made under the direction of the Medical Department of the German Army proved that wounds of the soft tissues inflicted by the small caliber bullet involve in nine per cent. large vessels and in seven per cent. arteries of considerable size which in the living subject would undoubtedly cause troublesome if not dangerous hemorrhage.

Habart has investigated the effect of the small caliber bullet on the large blood vessels, and has come to the conclusion that the wound inflicted resembled more closely incised wounds than those made by larger projectiles, and for this reason fears that primary hemorrhage will be more frequently met with in the future. Owing to the smallness of the wounds, external hemorrhage will be less frequent.

According to Praetorius, dangerous external hemorrhage only occurs in about five per cent. of all gunshot injuries, and not more than three per cent. die on the battlefield from hemorrhage alone. The comparative frequency of dangerous primary hemorrhage between wounds inflicted by the old and new projectiles has not been definitely established. It was anticipated that the small-caliber bullet, owing to its greater velocity and penetrating power, would cause death more frequently from primary acute hemorrhage than the round or large conical bullet, because the wounds inflicted by it resemble more nearly incised than contused wounds, as was formerly the case. The absence of a wide zone of contusion and extensive laceration in wounds of large blood vessels made by the new bullet would naturally tend to increase the danger from primary hemorrhage. Elastic constriction is a dangerous weapon on the battlefield, even when applied by the average medical officer. Elastic constriction, properly applied, when continued for more than two hours, is dangerous, as gangrene of the constricted limb is liable to follow as a consequence of the prolonged interruption of the circulation. Elastic constriction, improperly applied, as is so often the case,

often provokes rather than arrests hemorrhage. If the arterial circulation is not completely intercepted, venous hemorrhage and edema below the seat of imperfect constriction are sure to set in. Then too, prolonged constriction cannot fail in damaging the resisting capacity of the wounded tissues against infection, and the pain caused by it is intense, and will not yield to anything short of removal of the constrictor. I have no hesitation in expressing my conviction that elastic constriction, if too generally practiced, will do vastly more harm than good, and for this reason the use of the elastic constrictor should be excluded from general field practice, and in the exceptional cases in which its employment becomes a necessity, it should be applied by a medical officer, who must make it his duty to send the case as quickly as possible to the field hospital. The non-professionals of the Medical Corps can do much in arresting and diminishing primary hemorrhage by a resort to harmless means of temporary hemostasis. The simplest hemostasis is the force of gravitation. Elevation of the limb will often succeed, not only in arresting profuse venous, but also free arterial, bleeding. Acute flexion of the joint above the wound will accomplish the same. Digital compression over the antiseptic dressing can be employed to great advantage, and should always be made use of if the hemorrhage is not controlled by the antiseptic dressing. In very profuse hemorrhage the digital compression should be continued until a surgeon can be summoned. In large wounds the cavity is packed with both antiseptic compresses, and if hemorrhage threatens life, digital or manual pressure should be made over the antiseptic tampon.

Vessel injuries treated by antiseptic tamponade will seldom require ligation, as the tampon, if the wound remains aseptic, is allowed to remain until the lumen of the vessel has become obliterated permanently by thrombosis and cicatrization. In dressing penetrating wounds of the chest and abdomen complicated by dangerous internal hemorrhage, firm circular compression should be made over the antiseptic dressing.

The cartridge belt or gunstrap can be used to the greatest advantage in limiting respiratory and abdominal movements, and thus secure for the bleeding organs as near as can be done by external mechanical means a condition of rest.

From these and other considerations it becomes apparent that the most important function of those who are in immediate charge of the wounded on the battlefield consists in the early application of the first aid protective dressing, and in making use of safe temporary hemostatic measures which favor and expedite spontaneous arrest of hemorrhage, without touching the wound.

**FIXATION OF INJURED PART.**

Rest of the wounded part should be aimed at in applying the first aid dressing, as it is conducive to healing by primary intention, and serves a useful purpose as an aid to the prophylactic measures against infection by immobilizing the injured tissues, and as an additional safeguard against displacement of the antiseptic dressing. In gunshot wounds of the soft parts, immobilization of tissues by the dressing and muscle rest by slings, body bandage, etc., will suffice. In gunshot wounds of the chest and abdomen, firm circular compression by a cartridge belt or gunstrap will limit the movements of the abdominal and chest walls, and by doing so will favorably influence the bleeding, and subsequently the healing process. Immobilization is of the utmost importance in the treatment of gunshot wounds of the long bones. The ideal fixation splint in such cases would be the plastic plaster-of-paris dressing, but this method of fixation is entirely out of question behind the firing line, and, for reasons it is not necessary to enumerate, must be reserved for the field hospital. The fixation dressings on the field must be extemporized, and must necessarily consist of material which is always at hand. In fracture of the large long bones of the lower extremity, the opposite limb can be made use of as a splint, using cartridge belt, gunstrap, suspenders, handkerchief and articles of clothing for bandages. The rifle, saber and bayonet are always available, and can be used to advantage as temporary fixation splints. A fractured humerus can be immobilized by fastening the arm to the side of the chest. A well padded bayonet and sling will meet the mechanical indications in fractures of the forearm.

**TRANSPORTATION OF THE WOUNDED.**

Increased and improved facilities for rapid transportation of the wounded from the fighting line to a place of safety will be an

essential requirement in securing the greatest amount of benefit from conservative surgery upon future battlefields.

Habart makes the statement: "The fate of the wounded is not decided by the first aid dressing, but by the first transportation." With Tiroch and Wein, he regards the prompt removal of the wounded from the firing line to a place of safety as the first and most important duty in the care of the disabled soldiers. They are in favor of the aseptic treatment of wounds, which can only be entrusted to medical officers at the first dressing station. For this reason they are opposed to the rendering of first aid dressings by unqualified litter-bearers and the men themselves. The same views were expressed by many members of the German Surgical Society, in a discussion on this subject ten years ago, but many who sided with them at that time have, in the light of recent experience, taken the opposite ground. The desirability of an early removal of the wounded is very apparent, but in practice it is always found difficult and not infrequently impossible, without incurring new risks from complications and renewed exposure to the fire of the enemy. The chief medical officer must be guided by circumstances in regard to the greatest efficiency of his corps before and during each engagement, and must issue his orders accordingly.

The general introduction of the new infantry weapon will make it necessary to establish the field hospitals farther in the rear of the fighting line than formerly. Unless a natural protection by a hill, forest or deep ravine is available, it will be necessary to locate the field hospitals at least 3,000 meters from the line of action. To cover this ground during a battle exposes the wounded, as well as their carriers, to the fire of the enemy. As one of many instances, I will only mention the case of a lieutenant who was wounded in the battle of San Juan, Cuba. The moment he was shot he was carried by his comrades to the rear. During the transportation he was shot twice on the stretcher, and two of his carriers were killed. If the distance between the line of battle and the field hospital is not covered by some natural protection, the wounded will be safer, after they have been dressed, if they remain prone where they were disabled, or near by.

Ziemssen, of Wiesbaden, as the result of a very extensive experience during the Franco-Prussian War, is in favor of dividing the available medical officers into two equal detachments, one-half for the first dressing station, the other half behind the fighting line. He recommends that the latter should be further divided into flying ambulance detachments, made up of three surgeons, three litter-bearers and three privates, with a two-wheeled cart for a vehicle. He is of the opinion that the wounded should not be removed during the battle, as the fire is often more severe some distance from the line than behind it.

The most practical distribution of the medical men during a battle will be as follows :

1. First aid behind each regiment.
2. Collecting station.
3. Ambulance station.
4. Field hospital.

By far the greatest number will be required where their services are most needed, behind the fighting line, as few will suffice for the second and third stations. The sphere for the ambulances is between the third and fourth stations. No horse or mule-drawn vehicle is practical between the first and third stations. A two-wheeled light cart, built on the jinrikisha plan, drawn by men, is the only vehicle from which we can expect any benefit in the transportation of wounded and medical supplies between the first and third stations.

#### PROTECTION OF THE NON-COMBATANTS AND WOUNDED ON THE BATTLEFIELD.

It has been shown in the preceding pages that the importance of the first aid dressing overshadows the quick transportation of the wounded to the rear, and it remains for us to consider briefly some of the measures calculated to protect the non-combatants and wounded soldiers on the field.

Kirchberger suggests for the safety against the enemy's fire some kind of a bullet-proof wall that would answer this purpose, at a distance of two hundred meters, such as carts and litters with bullet-proof walls and roof. The desirability of such conveyances

cannot be denied, but as yet the desirable material for such protective walls has not been found, and when discovered and utilized it would leave unprotected the men in charge of them. A more practical way suggests itself to afford protection for the men on service and the wounded by utilizing as intrenchments the hills and ravines, where the wounded can be dressed and kept until the firing ceases. In the absence of such favorable natural defences, small intrenchments can be thrown up quickly by the members of the hospital corps, behind which the wounded and dressers will be protected against the small fire of the enemy.

Dr. J. D. Griffith has proved by numerous experiments that eleven inches of loose dirt suffice to arrest a small-caliber bullet, even at close range. The building of such miniature intrenchments could be finished and made ready for the reception of wounded in a few minutes in all places where the soil is abundant enough for such a purpose. We can never expect to be able to devise means and measures to protect the men engaged in the care of the wounded behind the line of battle, but much can be done in the way of diminishing the number of catastrophies. We, as military surgeons, must never forget that we are not only medical men, but also soldiers, and are expected to share the casualties of active warfare with the men who do the fighting. To the honor and credit of our profession, it must be said that the physicians on the field never shirked this risk, as shown by the records in the past. In case of retreat, the wounded with their attendants should remain where they are, as the speedy clearing of the battlefield of its wounded by the retreating army is a relic of savage barbarous warfare.

The treaty of the Geneva Convention guarantees safety to the wounded and non-combatants. The regulations of the International Red Cross Association were strictly observed on both sides during the Spanish-American Wars. The Red Cross flag of the ambulance station and field hospital should be large enough to be seen and recognized at a distance of at least three thousand meters, and the Red Cross on the ambulances should be made to cover the entire sides of the vehicle, as was done by the Boers. Field hospitals, in case of retreat, should not be moved. Sur-



geons and nurses must remain with the wounded, as this is in accord with the provisions of the Geneva Convention. The hospital supplies should also be placed on neutral ground, as is also undoubtedly the humane intention of the articles of the Geneva Convention.

#### INSTRUMENTS FOR FIELD SERVICE.

The surgical work of the military surgeon in the field is limited almost exclusively to the treatment of accidental wounds. His success as a surgeon depends almost exclusively on his proficiency in guarding against wound infection, and his mechanical skill in the treatment of compound fractures. In the line of battle the surgeon will limit his work to hemostasis and tracheotomy in cases of threatened asphyxia from wounds of the larynx and trachea, and at the dressing stations to primary amputations. In the performance of emergency operations behind the fighting line hand disinfection as practiced in the usual manner is of course absolutely out of question. Fortunately Vollbrecht has succeeded in making an antiseptic paste of a mixture of cocoanut oil and 96 per cent. alcohol which when thoroughly rubbed into the skin renders the hands practically aseptic without the use of brush and water. This paste retains its antiseptic proportion when it is wrapped in zinc foil and a package of it should be carried by the surgeons at the front who may be called upon at any moment to perform an emergency operation. The operations he is expected to perform are few; and require but a limited number of instruments. The large velvet-lined instrument cases and bulky, unwieldy instruments have happily disappeared, and opened the way for small, aseptic canvas covers and modern instruments. Instruments in the hands of unprofessional first aid dressers are unnecessary, and by meddlesome interference are likely to prove a source of danger. The only instrument the ordinary dresser is in need of is a strong pocket-knife, with a large sharp blade, with which to cut the bandage, clothes of the wounded and splint material, if available. Although the surgeon in the field will have seldom use for instruments, he should be supplied with a small aseptic, flexible instrument case, which contains in a most compact form all of the essential instruments for emergency opera-

tions. For a number of years the writer has made an extended study of the case and contents for work in military and emergency surgery. He has found by observation and ample experience that the instruments used in emergency work can be safely carried in roll-up, washable canvass rolls, in which each article is held securely in place by elastic loops. If the name of each instrument is stamped with indelible ink in the place it should occupy, there will be no difficulty experienced in replacing properly and quickly the entire set after use. This plan of carrying instruments in the field recommends itself for consideration by military surgeons especially, for it makes provision for changes that might appear desirable in the set, and discarding such as might be regarded as unnecessary, and different patterns may be included from time to time.

A second and similarly stamped roll, properly sterilized, should be in readiness in a separate compartment of the outer leather cover, so that the instruments can be transferred to it after each exposure to infection. The structure and form of the outer wrapping of the canvass roll holding the instruments are of the greatest importance. It should be light, soft and flexible, without any sharp corners, and, if possible, small enough to be carried in a hand-bag or overcoat pocket. The outer cover of the case I recommend is of soft leather, with rounded ends and corners with a double compartment, one for the roll of instruments, the other for the empty canvas roll. A slip handle, also of leather, is provided, so that the case can be carried like a hand-bag. For military service a leather strap is attached, so that the case can be carried over the shoulder. It contains the following instruments: 11 Kocher's hemostatic forceps; 1 Abbe's hemostatic forceps and needle holder combined; 1 small scalpel; 1 large scalpel; 1 straight bistoury; 1 small tenotome; 1 tenaculum; 1 straight scissors; 1 scissors curved on the flat; 1 MacLean's folding amputating knife; 1 bone-cutting forceps; double-end retractors with guards; 1 author's saw, with guard for blade; 1 plain dressing forceps; 1 ligature-carrier and retractor, 2 author's tissue forceps, with three and five teeth and catch-slide; 1 bone chisel; 1 bone gouge; 1 sharp spoon and periosteal elevator; 1 author's bullet

forceps; 1 author's bullet probe; 2 common probes; 1 exploring trocar; 12 silkworm gut sutures; 12 surgical needles (assorted); 2 skeins of braided silk; 1 coil of silver wire; six intestinal needles. The six knives are included in two protecting plates that rest side by side, forming one fold of the canvas roll. The canvas cover is eight inches in width and; including flap, thirty-one inches in length. The whole is encased in a flexible leather cover, nineteen inches in length; five inches in breadth, and five inches in thickness, and weighs, complete; four and one-half pounds. One of the principal advantages of the instrument case, as described, is that after removing the canvas cover from the leather case the cover with all its contents, including suturing material and needles, can be sterilized at a moment's notice, by boiling for a few minutes in a soda solution, when everything is in readiness for the operation. The author made use of one of these cases during the Spanish-American War, and his experience with it convinced him that it possesses merits which should entitle it to the careful consideration of military authorities.

#### THE ULTIMATE PROPHYLACTIC VALUE OF THE FIRST AID DRESSING

If the first aid dressing accomplishes what has been claimed for it, it becomes evident that in the great majority of cases it should not be disturbed until the wound has healed. This position has been amply supported by the experiences gathered during the Spanish-American and South African Wars. There are not many military surgeons who, at the present time, would side with Wein, who insisted that the first aid dressing applied by laymen should invariably be removed at the first dressing station and replaced by another one by the surgeons. If the points emphasized by von Bergmann in 1890 have been complied with in the application of the dressing by laymen or surgeons in applying the dressing, the occasions will be few when such interference will become necessary. He cautioned not to touch the wound, not to attempt to cleanse it or explore it, even in case the bullet carried fragments of clothing with it, not to irrigate and not to remove dry blood crusts.

Bertelsmann places particular stress on not interfering with dry blood crusts. During his service in the South African War,

he observed that the dry air had a good effect in causing speedy desiccation of the blood in the opening of the wound and around it. In some of his cases the wounds were not dressed for twenty-four hours. The dry blood crust was never disturbed, the dressing applied over it, and his results were extremely satisfactory. In fifty-two cases treated in that manner, the wounds healed by primary intention. Bacteria do not multiply in a dry medium. For the purpose of favoring the speedy incrustation of the blood in the dressing, the adhesive strips with which the dressing is held in place should always be applied over the sides and never directly over the wound.

The first aid dressing should always be examined by the surgeons at the ambulance station and removed only for good reasons. Unnecessary change of the first aid dressing at the field and base hospitals during the war in Cuba was responsible for a not inconsiderable number of infections, which could be traced to no other source. To prevent such occurrences in the future, surgeons should observe more strictly the requirement by fastening the necessary legend securely to the dressing. This function must be, for obvious reasons, assigned to the surgeons at the front and the first dressing station.

#### CONCLUSIONS.

1. The first and most important duty of the military surgeon behind the fighting line is to secure for the wounded protection against wound infection by the early and secure application of the first aid dressing.

2. Preliminary disinfection of the wound and its environments is not only unnecessary, but harmful.

3. The principles which govern the modern treatment of gunshot wounds were formulated by von Bergmann and Reyher during the Russo-Turkish War, and with very few exceptions remain the same to-day.

4. Military surgery is and always will remain emergency surgery, and for this reason the methods employed in the prevention of wound infection must be made as simple and effective as possible.

5. Absolute asepsis is neither attainable nor essential in protecting a recent gunshot wound against infection.

6. The first aid package must be made of minimum size and weight, compatible with the purposes for which it is intended.

7. The dressing material of the first aid package must be hygroscopic, and not only aseptic, but antiseptic, and from it must be excluded everything which interferes with the rapid drying of the wound secretion, consequently all impermeable fabric, waxed paper, etc.

8. The antiseptic relied upon must be non-toxic, non-volatile and resistant to chemical changes.

9. The most desirable antiseptic is a combination of boracic and salicylic acid, in the proportion of 4:1, incorporated in the dressing in powder form, at a point which will correspond with the location of the wound.

10. Every first aid package should contain as one of its important component parts two strips of rubber adhesive plaster, with which to fasten the dressing in place.

11. The dressing material should be connected with the retaining bandage, and the adhesive strips fastened to it, and two pins to the terminal end of the bandage.

12. The gauze roller should take the place of the triangular bandage.

23. A dry crust formed by the desiccated blood and hygroscopic material by which it is absorbed constitutes the most efficient occlusion dressing.

14. For field dressings, hygroscopic cotton is preferable to gauze, as it is a more effective filter, and forms with the infiltrated dry blood a more reliable protective crust.

15. Practically all recent gunshot wounds are aseptic.

16. Post-injury infection must be prevented by bringing nothing in contact with the wound prior to the application of the first aid dressing, consequently no recent gunshot wound should be touched with the finger or probe.

17. In all great wars the number of wounded exceeds the working capacity of the medical officers at the front, and consequently most of the first aid dressings must be applied by the

wounded themselves, their comrades, and non-professional non-combatants.

18. The elastic constrictor has no place in the first aid package, and should only be used by surgeons, in exceptional cases, as its indiscriminate use would be followed by more harm than benefit.

19. The early removal of the wounded from the firing line to a place of safety is desirable, but is secondary to the importance of the first aid dressing.

20. The first aid dressing should be applied as soon as possible, and transportation of the wounded to the rear when it is safest and most practicable.

21. If early transportation of the wounded is attended by too much risk, they should be protected against the fire of the enemy by diminutive earth-works, which can be thrown up quickly, where they should remain until the firing ceases.

22. In case of retreat, the field hospitals should not be moved, and the surgeons and nurses should remain with the wounded.

23. The only instrument which the non-professional should carry on the battlefield is a large, stout pocket-knife. The surgeons engaged in first aid work should be supplied with a compact operating case, which should contain everything necessary for emergency operations.

24. In the absence of positive indications, the first aid dressing should not be removed until the wound has healed.

25. The surgeons who apply or inspect the first aid dressing should, on a tag fastened to the patient's clothing or dressing, notify the hospital surgeons as to the probable conditions of the wound, by classifying them into aseptic and infected wounds, as in so doing the unnecessary change of dressing is guarded against

## THE PRESERVATION OF THE HEALTH OF THE SOLDIER.

By WILLIAM HILL-CLIMO, M.D., M.R.C.S.  
LONDON, ENGLAND.

BRIGADE-SURGEON LIEUTENANT-COLONEL ARMY  
MEDICAL STAFF, RETIRED.

THIS subject stands apart from the medical treatment of the sick in hospital, and of the wounded in war, and from their medical care during convalescence. Also it does not refer to those important measures, which have to be undertaken for the prevention of zymotic and epidemic diseases in cantonments and in the field whenever large bodies of men are massed together in a limited area. These are duties about which there never has been any difference of opinion in regard to the responsibility of the Army Medical service, though occasionally the utility of sanitary measures in the field has met with opposition from high authority. My present purpose is to show that the medical services must be more intimately associated with the individual soldier in health than hitherto has been the case, and to prove that medical failure in war is caused by the want of it. In the article, "Army Organisation: The Recruit."\* I suggested that the medical service should be joined with the Executive in the training of the recruit, and now the necessity of continuing the medical supervision of personal health during the whole course of the soldier's service will be dealt with.

The reader may think that it is a platitude to say that the preservation of the health of the soldier is of prime importance, and that it ought to be the chief concern of the medical service. That is not so, for in practice it has been persistently neglected. This neglect up to recent times was due to ignorance of the laws of health, and to the belief that, outside pandemic causes, individual vulnerability to disease was beyond control, and could

---

\*See the May, 1903, number of "The Empire Review," Messrs Macmillan & Co., St. Martin's Street, London, W. C.

only be accounted for by "the Visitation of God." The Victorian Era has been marked by great progress in sanitary science, which obtained more general recognition when the medical disasters of the Crimean war were made public, and when the causes of the large mortality and invaliding of British Troops in India were understood. An endeavour was then made to improve the personal hygiene of the soldier, and with this object the Army Medical School was instituted in 1860.

While still on the threshold of this discussion it will be well to consider what was the position held by sanitary science at this time. Public Health had no place in medical education, and sanitary defects were referred to in the schools only in relation to certain special diseases; briefly it may be described as having been for Medical Science the chemical age. Personal hygiene was much in the same state as it was left by Moses,—the Sanitarian of all time,—and antiseptic surgery had not advanced much further than when "pouring in oil and wine" were relied on to promote healing. Still it was a time of hope and of expectancy, for the work of the elder Jenner was bearing fruit, and his discovery of cow-pox had shown the connection between the diseases of men and animals. More recently the differentiation of continued fevers by Murchison, and the sewage origin of enteric fever by Sir William Jenner had paved the way to further discovery though to Gerhard, of Philadelphia, is due the great honor of having first laid down the differences between typhoid and typhus fevers.\*

The labours of Pasteur and of Lord Lister, who is, happily, still with us, which followed, have opened up a new world in which is found the biological origin of zymotic diseases, and of those morbid processes, which made wounds so fatal before aseptic, and antiseptic treatment was known. Other workers have continued to labour in the same field with beneficial results. I am not here concerned with these later developments further than to note that it is through them there has become general a more correct knowledge of the laws of health, and that so much has been done towards the amelioration of the insanitary conditions of the civil population.

---

\*See the Principles and Practice of Medicine. Osler.



With such a history it is curious to have to comment upon the neglect of personal hygiene in the British Army at the present time. It is a startling statement to have to make, but it is on that account not less true, that the medical supervision of the soldier, while in health and at his duty, is inferior to what it was forty years ago. How far this want of medical supervision can be said to apply to Continental armies must be determined by those having the special knowledge. I am of opinion, notwithstanding that they have regimental medical officers, that in them also there is wanting that medical control which is so essential to meet the present conditions of military service. It is because I believe that armies, recruited from the Anglo-Saxon race, more especially when the recruitment is voluntary, require personal sanitary protection that I have chosen this subject for the JOURNAL of this Association, but a more special reason will be given later on.

How was it that the intentions of the founders of the Army Medical School were gradually lost sight of until, in 1882, the organization of the medical service took place on lines in which they were ignored? Paradoxical as it may appear it was in great part due to the progress made by Sanitary Science during that period, which induced the belief that the way to health lay in those larger measures of sanitation, which were then undertaken. Essential as are a pure and ample water supply, a perfect system of sewage disposal, good drainage, the housing of the troops in spacious and well-ventilated barracks, and all those other external conditions, grouped together under the head of sanitary environment, there are powerful influence at work in the soldier himself, which make or mar his health, and for which I now plead the best sanitary supervision the medical service can give him, believing as I do that their neglect means military inefficiency.

The more direct causes were (1) military prejudice, (2) professional sensitiveness, (3) false economy, (4) racial characteristics and (5) short service. Each of which will have to be briefly considered, Military prejudice is common in all armies, and in the British Army, with its conservative character, and powerful regimental traditions, it is eminently so. It is a feeling which

I think the medical service understands and shares, therefore due allowance ought to be made for it. A master in his own house does not like his authority to be interfered with, so in a regiment outside interference is not easily brooked. Since the abolition of the regimental system in 1882 the position of a medical officer in sanitary charge of barrack buildings, etc., has not been an enviable one; he has ceased to be in sympathetic touch with the regiment or corps, from this has sprung the professional sensitiveness which is the second cause I have suggested of ineffective personal supervision. Much more might be said on both these points but it is sufficient to affirm that this supervision will never be satisfactory until a closer union is established between the R. A. M. C. and regiments and corps.

In discussing this question with officers of experience it has been suggested that the medical history sheet affords the medical officer sufficient information to make the personal supervision of the soldier I advocate unnecessary, which seems, on the other hand, to be on a par with shutting the stable door after the horse has been stolen, for the medical history sheet tells only of injury already done to the constitution, though, to some extent, it helps in forming an opinion of what may be expected in the future, but it does not materially assist towards the maintenance of health, that only can be learnt through personal knowledge, a knowledge which has its value doubled by the confidence it begets between the soldier and the Medical Officer. This is not the occasion for discussing questions of organization, but as Medical Officers must be appointed to regiments on the outbreak of war a change, so sudden, and so radical, must be attended with administrative difficulties, which do not tend to efficiency.

Armies raised by voluntary recruitment, are only possible in countries of great wealth with free institutions, when the strength of their establishments is subject to the popular vote, and is not dominated by some supreme military necessity, such as confronts the European Continental Powers. This immunity the British Empire no longer possesses, though the country hardly realizes the fact. This by the way, but what I am concerned with now is to show that, through its military establishments being subject

to parliamentary sanction, which ultimately means the wish of the Electorate, their strength depends upon the accidents of the moment. To-day there is demanded a large increase of the army, and to-morrow there may be insisted on a reduction all round. Hitherto the Medical Service has been the greatest sufferer; it began in 1862, and it has been continued at various time since, until in 1882, with the abolition of the regimental system, it reached its climax, a truly false economy.

The spirit of independence, the love of adventure and of sport and the manliness, which is the heritage of centuries of freedom are some of the racial characteristics, which make our young soldier intolerant of restraint, more especially when it comes from those who are comparatively strangers to them. It is the irony of fate that the qualities, which make the Anglo-Saxon soldier the finest in the world, are those which involve the greatest danger to health unless instructed and developed by a sympathetic discipline. No discipline can give lasting results unless it appeals to the individual intelligence; in matters pertaining to health the necessary instruction must be furnished by the Medical Service.

Without short service it would have been impossible to have made the present medical arrangements for regiments; under no other circumstances would they have been tolerated. As long as young soldiers served a few months with the colours, and then went to the reserve, the ill consequences escaped detection; it was not until there was a great war that the public could obtain a true knowledge of the facts, which are (1) that on the outbreak of war about 25 per cent. of the army will have to be discarded as unfit for service in the field on medical grounds, (2) that in its early stages its military efficiency will be jeopardized owing to the large number of men who will break down from physical unfitness, and the strain of war, and (3) that, until the troops become seasoned, the wastage from death and from invaliding will be enormous. These are facts which the South African war has incontestably proved; there is no getting away from them.

In the article, already quoted from, and in the article, "Medical Lessons of the War,"\* I showed that, with voluntary

\*See the January, 1903, number of "United Service Magazine," published by William Clowes & Sons, 23 Cockspur St., London, S. W.

recruitment, restricted to the sections of the population least capable of military service, and whose physique is inferior to that of the general population of the same age, there must follow military inefficiency and grievous loss of life in war. What I wish now to direct attention to is that the responsibility does not rest with the medical service, but, if fault is to be found, it must be found with the conditions under which the medical service has to work in regard to the selection and training of the recruit, and to the want of association of the Medical service with the personal hygiene of the soldier all through his service.

Of course with voluntary recruitment of the British Army there must always be unpreparedness for war for its numbers are too large to allow of strict selection unless during peace the individual soldier is cared for, and made fit, which can only be done in the way herein suggested. The British Nation clamours for an army ready to go anywhere, and to do anything yet it will have voluntary recruitment. It is somewhat in the position of the farmer who wished to marry, but who was not quite sure of the wisdom of his choice, yet he ended his prayer for Divine guidance with the words: "But, oh Lord, let it be Betty." If the British Nation will have its "Betty" let it not impose the responsibility on the medical service without granting it the power to fulfil it.

The supervision I recommend must not be limited to the Regular Army, but should be extended to the Militia, Yeomanry, and Volunteers, for in future wars these auxiliary forces will be largely employed. The South African war has proved their value. To improvise an army to meet a great national danger is an impossibility without incurring serious financial liabilities, and without grievous loss of life, and even, under these circumstances, only when the strategical position of the country gives it sufficient time to complete its preparations. The members of this Association will naturally ask what has this skeleton in the closet of another country to say to them? Because I believe they have a real and practical interest in the question I submit it for their consideration.

The Regular Army of the United States of America being extremely small, relatively to the population, consists of picked

men, and therefore it may be considered that its organization is beyond criticism, or at least outside the scope of this article. No army can be so considered unless it is competent to fulfil all the military obligations of its country; this is a proposition which cannot be disputed. The United States in a little over the life of one generation has been twice at war, and on each occasion the strength of its regular army on the outbreak of war was as a drop in the ocean compared to the total number of combatants subsequently employed.

In this place it is not necessary to give the health statistics of the Army of the United States in the Civil War, or in the war with Spain; it would indeed be an instance of carrying coals to Newcastle. Sufficient for my purpose it is to state that in the Civil War the total mortality was approximately 271,000, of which two-thirds was from disease, and that "The annual mortality from disease was 32 per 1,000 in the case of the regular army, and 55 per 1,000 from the less carefully examined Volunteers."\* This difference of rates was due to the want of careful medical inspection, of preparation for training, and of health supervision of the Volunteers. These are duties which can only be properly performed by Medical officers of experience, but even for them the task is made well nigh impossible if delayed until war is at hand.

The immunity, which the United States has enjoyed from liability to foreign entanglement, is fast disappearing, or at any rate it is not on the same footing that it was 10 years ago. Since then its international responsibilities have increased, and its interests have extended to many lands, and have spread over many seas. In the growth of those interests and in the struggle for commercial supremacy, which, in the future, the economic conditions of the Old World, and a progressive civilization, will make more acute, there lies danger not limited to individual nations but extending to whole races. Therefore, it is the first duty of every country to improve the physical development of its people, so that each male, on arriving at the age of maturity, may be capable of bearing arms and contributing to the defence of the

---

\*Military Hygiene, Munson.

fatherland. For the Anglo-Saxon race, both parent stock, and its first born, there has been given the warning, may it not be lost !!!

The conclusions which I have come to, are that a nation, whose system of recruitment is voluntary; should use every effort to improve the physical development of the people so that all classes in an emergency should be equally capable of undertaking military service. That after enlistment, the recruit should be prepared for training, which he should not undergo until pronounced fit. That during training, and all through his subsequent service his health should be carefully supervised. That these measures are specially required for countries whose army organization is not single but composite, that is to say when the troops consist of Regulars, Militia, Volunteers, etc., and are raised under different conditions of service, and that full power must be given it to carry them out.

The object of this article has not been to detail these measures. Every military medical officer knows what they ought to be. What I wish to convey is that most armies, because of circumstances, which it is needless to dwell on, for they are disappearing, and moreover I wish to avoid contentious matter, do not obtain at the present time the benefits they ought to receive from the progressive development of sanitary science. My friend and teacher, the late Professor Parkes of the Army Medical School, urged upon me the importance of the personal hygiene of the soldier. This memory has often come back to me, and it has been with regret I have noticed that, while sanitary science progressed, its application to the individual soldier has been relaxed. The wars of the United States in Cuba and in the Philippines, and of the British Empire in South Africa will not have been in vain if out of them there grows the knowledge of the truth that sanitary safety can only be had in the closer union of the Medical service with the other services of the army, and of its intimate association with each regimental and corps unit.

## HYSTERIA IN THE MALE WITH REPORT OF A CASE.

By SHELDON G. EVANS, M.D.

SURGEON IN THE UNITED STATES NAVY.

THE frequency with which I have met cases of hysteria in Naval practice in the last few years led me to believe that a few remarks on this subject might be of interest. In looking over my case book I note a rather remarkable instance of this disease in an otherwise strong and robust man, which I saw while on duty at the Naval Hospital in Philadelphia.

I think, in the service, we lose sight of the well known fact that hysteria is by no means an uncommon affection and that we too frequently disguise the true condition under another name, for instance Neurasthenia or Hypochondriasis.

Before recording the case as it appears in my case book it would no doubt be well to make a few remarks in general upon the subject of hysteria in the male.

It has been recently shown, as I have stated, that hysteria in the male is by no means such a rare disease as was formerly supposed, and, according to Dana, the proportion of male to female hysterical patients is as one to four.

The condition in the male is much more frequently mistaken for other diseases than in the female where we are always suspicious of hysteria.

Pershing has stated that a diagnosis of hysteria may be based upon the following five conditions:

1. The exclusion of other functional diseases, especially epilepsy, and of all organic disease.
2. The existence of predisposition.
3. The occurrence of symptoms in response to suggestion.

And here let me state a remarkable instance which I saw in the past two months. The patient was in a violent fit and apparently unconscious when I remarked, at the bedside, that I had

never seen a true case of epilepsy where the thumbs were not turned in (they were not in this case). The man soon recovered and when a recurring fit occurred the thumbs were turned in.

4. The occurrence of hysterical seizures.

5. The presence of hysterical stigmata.

With these few remarks let us proceed to the case in question:

J. W., Private, U.S.M.C., white, aged 23, an apparently robust man with a good family history and no syphilitic taint, was first admitted to the Hospital on August 17th, with diagnosis of Cerebo-spinal fever, with the following history.

Was on duty at the Navy Yard and was ordered to cut grass and while so engaged lost consciousness and did not regain it until brought to the hospital some hours afterward.

On December 29th, the patient being still at the hospital the diagnosis was changed to "Sequelae of cerebo-spinal fever," with "Convulsio and neuro-retinitis" with possible involvement of the Choroid; for the latter affection the galvanic current (2 milliamperes) was applied to each eye for about two minutes each day with rapid improvement.

The convulsive paroxysms continued and the following is the condition in which I found him about a year after the development of the disease, as it was not until then that I saw the case.

The attacks came on suddenly without premonition at times and at others the patient would state that they were coming on but gave no reason for his statement.

Opisthotonos more or less marked was an early symptom, there was no cry at the beginning of the attack and no frothing at the mouth and the attacks occurred almost without exception while the patient was in bed.

The spasm was markedly tonic in character and the grinding of the teeth was a constant symptom.

The spasm never became truly clonic and in regaining consciousness (which was never to my mind entirely lost) patient was apparently well and complained only of a slight headache. The eyeballs were rolled upward and outward but the pupils responded to light.

I copy the following history from the record of the case prior to the time I saw it.

1st January:—Has had no convulsions since last note; this morning he said he felt one coming on and he was given  $\frac{1}{8}$  gr. Hyoscine Hydrobromate hypodermically; this apparently had the effect of aborting threatened attack. He has complained for



a day or two of nocturnal seminal emissions for which he has been taking camphor and opium at bedtime.

2nd. January:—Convulsions at 2 p. m.

8th January:—Four convulsions since last note. Condition of his eyes has improved. Since January 4th has been having suppositories of 1 gr. Ext. Opium at night which has completely controlled emissions.

15th January:—Three attacks during the week. After the last paroxysm the patient was quite intractable, was delirious and wandered about the ward in an aimless sort of a way and it was finally deemed advisable to secure him by humane restraints.  $\frac{1}{10}$  gr. Hyoscine this a. m. aborted threatened attack.

29th January:—Since 15th instant patient has had six attacks. Two blisters the size of a silver dollar was applied over spine with no appreciable result.

5th February:—The course of blisters inaugurated last week has been continued until eight of them have been applied over the spine. Has improved wonderfully in every way, ten days without an attack.

7th February:—Retention of urine (patient's statement, since 5th), thirty ounces drawn by catheter.

12th February:—Eyes much impaired. Retention of urine continues and patient has not passed water without aid since 5th instant. One hundred to one hundred and twenty ounces of urine are drawn daily. The urine is very pale but contains neither albumin or sugar. Specific gravity shows the extraordinarily low figure of 1.001. Strychnine Sulph.  $\frac{1}{80}$  t.i.d.

19th February:—Retention continued but patient passes catheter himself. Two attacks aborted by Hyoscine.

22nd February:—Patient discharged feeling perfectly well. Retention continues.

On June 22nd patient was again admitted to Hospital having since discharge been under treatment at various civil Hospitals in Washington and Philadelphia. Diagnosis on Hospital ticket *Convulsio*. He states that he was treated for epilepsy at these Hospitals and complains of the treatment given.

He has been having recurring attacks of convulsions, extending over intervals of several days with intervening intervals of about ten days and he says he can now tell when attacks are coming on. "They always start in the toes, all the 'nerves' commencing to shake and move until this feeling arrives at the calves when I drop and lose consciousness regaining it *on the inhalation of Chloroform*." He states also that with each inspiration he has pain in the lumbar region and occasionally in right thigh and he complains frequently of severe frontal headache.

His right testicle is enlarged, indurated and painful, this condition has existed for a week and is attributed to a cold, as he has no gonorrhoea.

23rd June:—Had four convulsions last night which yielded to the hypodermic use of Hyoscine and the inhalation of chloroform. Pupils well dilated from former remedy. These convulsions are not preceded by a cry but commence with grinding of the teeth, clutching of the hands and violent muscular contractions. There is no foaming at the mouth. The eyelids are closed and are forced open with difficulty. He is apparently unconscious but is sensitive to pain and after the inhalation of a few drops of chloroform he commences to talk, and soon becomes rational and muscular movements cease. There is no stupor or drowsiness after the attack.

24th June:—No headache. No return of convulsions. Urine, specific gravity 1.024, no sugar or albumin. Has marked hyperaesthesia of skin over upper part of left breast. Treatment Trinitrin  $\frac{1}{16}$  gr., t.i.d.

27th June:—Today had convulsion about noon which was thoroughly watched and was as follows:

Commenced with trismus, while patient was lying down. The nurses attention was first engaged by the sound caused by the patient's teeth grinding together. There was no cry, foaming at the mouth, etc., jaws were closed, face not flush or pallid, eyes closed, lids open with difficulty, the patient resisting the effort to open them by moving his head; eyeballs turned up and pupils normal and corneal reflex was present, Spasms mostly tonic, slight clonus of the lower extremities, fingers clenched in hands, on pricking thigh with needle he moved lower extremity and pressure on the inflamed testicle was felt and caused pain. The patient continued to have convulsions at various intervals for some time. Potassii bromidum was given continuously without apparent effect.

On 26th July patient had a convulsion, the first I had seen and at once administered  $\frac{1}{16}$  gr. Apomorphine (feeling confident of the nature of his trouble) with the result of at once causing violent emesis and stopping the attack.

For some time this treatment was used as it was thought the patient craved Hyoscine as he frequently asked for it. Patient became enraged at the use of Apomorphine and the hysterical nature of his disease became more evident. He objected strenuously at the use of the padded straps and on being left alone the attacks would soon cease.

On Sept. 13th patient was discharged to Naval Home, at his own request, having had no convulsions since August 23d. I was able to keep track of this case for many months after his discharge and there was no recurrence of the disease.

## THE PATHOLOGY OF LATENT MALARIAL INFECTION AS OBSERVED AT AUTOPSY.\*

By LIEUTENANT CHARLES F. CRAIG,  
ASSISTANT SURGEON, U.S. ARMY; PATHOLOGIST AND BACTERIOLOGIST OF THE U.S. ARMY GENERAL HOSPITAL,  
PRESIDIO OF SAN FRANCISCO, CAL.

THE subject of the pathology of malaria has been very thoroughly investigated by various observers, and the conditions found in acute and chronic infections are well known. The pathology of latent infections, however, has not been by any means, thoroughly investigated. By latent infections I mean malarial infection which is not manifested by any symptoms, and in which an examination of the blood does not necessarily show the presence of malarial parasites.

In previous communications<sup>1 2 3</sup> I have described somewhat briefly the pathology of some of these cases, and it is my intention in this paper to give the pathological changes found in the various organs in cases dying from other diseases, but in which a latent malarial infection was discovered.

If we confine the term "latent malarial infection" only to those cases in which no symptoms are present and no parasites are found on repeated examination of the blood, it will be at once seen why the pathology of this condition has not been thoroughly investigated. Such cases of malarial infection will only be discovered at autopsy, the patient having perished from some other disease process. Outside the tropics and the more malarial regions of our own country such

---

\*Read at the Twelfth Annual Meeting of the Association of Military Surgeons of the United States, at Boston, U.S.A. Published with permission of the Surgeon General U.S. Army.

<sup>1</sup>The Estivo-autumnal (Remittent) Malarial Fever.

<sup>2</sup>Latent and Masked Malarial Fevers. *Medical Record*.

<sup>3</sup>Report to Surgeon General, June 30, 1902.

cases will necessarily be very rare. There would be little importance in describing the conditions found in a latent infection in which the parasites are easily demonstrable in the blood as in such cases we should expect to find the same pathological changes as are found in acute infections, but to a less degree. Therefore in this paper I shall touch only upon those cases in which no parasites were observed in the blood, and no clinical symptoms of malaria were detected before death.

During the last three years of service at this Hospital seven cases have been observed in which the autopsy showed latent malarial infection unaccompanied by clinical symptoms or the presence of parasites in the blood before death. Three of these cases have been benign tertian infections, and four estivo-autumnal infections of the tertian type. In describing the pathology of these cases I shall first speak of the tertian cases.

#### PATHOLOGY OF LATENT TERTIAN INFECTIONS:

The pathological lesions found were confined entirely to the spleen and liver. This local pathological change is peculiar, as it was also shown to be present in the estivo-autumnal latent infections. In numerous cases coming to autopsy from other disease processes, accompanied by a latent malarial infection in which the parasites were found in the blood, but in which no definite symptoms were produced, it was noticed that the chief pathological lesions were also found in the liver and spleen, but that other organs showed them to some extent. It is well known that in an acute malarial infection almost every organ of the body is more or less involved. Thus it will be seen that from the mildest latent infections there is a gradual progress in pathological lesions, first manifested in the spleen and liver and spreading, according to the extent of the infection and the severity of it, to other organs.

*Spleen:*—The most marked pathological lesions were present always in the spleen. The organ, in the tertian infections, was considerably enlarged and dark bluish gray in color externally, the capsule being as a rule smooth and tense, the notches distinct, the organ decreased somewhat in con-

sistence. Upon section, the color was a dark brownish red, but did not present that intense brownish or black color found in well marked acute infections; this, of course, is easily understood, from the fact that the parasites present were comparatively few in number, and that little pigment was therefore formed. Microscopically the sections of the spleen showed intense congestion of the splenic sinuses, together with pigmentation, especially marked as in those of the Malpighian bodies and along the fibrous trabeculae. The connective tissue of the organ was not increased in amount. The cells of the splenic pulp were evidently greatly increased in number, and many of the cells showed marked division of the nucleus. Many also were pigmented and distorted in shape.

The above are the chief pathological conditions found aside from the parasitology. The splenic sinuses and capillaries showed the presence of numerous parasite infected red cells and pigmented leukocytes. While these infected red cells were not nearly as numerous as in acute infections or in more advanced latent infections, still they were sufficiently numerous to be very noticeable. The parasites were in about the same stage of development in each case, but it so happened that the cases had died at such a period that the entire cycle of the tertian parasite within the human body could be worked out from the examination of sections of spleen from those cases. As far as could be ascertained, the parasites presented no essential difference in their appearance from those found in the red cells in the peripheral blood during an acute infection. The segmenting bodies were numerous in one case, the segments appearing, however, slightly more refractive and more clearly outlined than when found in the peripheral blood. In fact, it may be said as a general rule, that the parasites in these infected corpuscles in the spleen were more distinct and more easily recognized than the same parasites in the peripheral blood. Their staining reactions were exactly the same, and it could not be ascertained that they stained more easily or more deeply than when present in the peripheral blood.

The chief point of importance in the pathology of the latent infections, as observed in these cases, is that the entire cycle of the parasite can be completed within the spleen when no parasites are demonstrable elsewhere in the body, thus proving conclusively that the seat of the initial malarial infection is in the spleen. While this has been the opinion of nearly all authorities for years few observations are on record where as in these cases no malarial symptoms or parasites could be determined while the patient was alive, but the entire human life cycle of the parasites was found in the sections of the spleen.

Besides the infected red cells, numerous leukocytes were observed containing pigment in the form of large and small granules, and a few containing malarial parasites, some of the parasites being evidently but just engulfed and typical in appearance. There were also present very large white cells, known as phagocytes, containing much pigment in large blocks, and often one or more half to nearly full grown parasites. A small amount of free pigment was observed lying within the splenic sinuses and collected around the Malpighian corpuscles and the trabeculae.

*Liver:*—Macroscopically the liver did not differ in appearance from that of a normal organ, in so far as the pathology of malaria is concerned. One case, a latent tertian infection was suffering from cirrhosis of the liver, which presented the ordinary appearances of that disease. The organ did not appear pigmented, and upon section the only thing observable was marked congestion, venous in character. The sections of the liver in these cases showed a few pigmented leukocytes within the capillaries, some of the leukocytes containing what appeared to be degenerated malarial parasites. There was but little pigment present in the organ, most of it being within the leukocytes mentioned. No large phagocytes were observed, most of the pigmented leukocytes being of the ordinary polymorpho-nuclear variety. A very careful search was made in the sections of the liver for infected red corpuscles, but in no one of the cases was an infected red cell seen.

The pathology of latent tertian infections as shown by the above findings, is confined almost entirely to the spleen, the liver being but slightly involved. The changes in the spleen consist chiefly in an engorgement of the splenic sinuses with red cells and leukocytes, the presence of infected red cells and of phagocytes and melaniferous leukocytes, and increase in the cells of the splenic pulp with more or less degeneration and karyokinesis, and pigmentation of the organ confined to the Malpighian corpuscles and the splenic sinuses and trabeculae. In the liver the chief changes consist in slight pigmentation, more or less venous congestion, and the presence of melaniferous leukocytes.

*The Pathology of Latent Estivo-Autumnal Infections:—*  
The pathology of latent estivo-autumnal infections differed but slightly from that of the tertian infections, and chiefly in the character of the parasites present. The spleen, microscopically, appeared much as the spleen in the tertian infections, save that in all cases it was not as large or as much pigmented. Upon section the consistence was decreased, the Malpighian corpuscles were nearly invisible, the color a dark mahogany red—in one case brown—the substance of the spleen being almost diffuent in two of the cases. Upon microscopical examination, the same changes were found as in the tertian latent infections, the splenic sinuses being congested, the cells of the splenic pulp increased in number and showing marked division of the nucleus, considerable pigmentation present, especially observable around the Malpighian corpuscles and the edges of the trabeculae, and the presence of infected red cells and of melaniferous leukocytes. The infected red cells were not as numerous as in the tertian latent infections. The parasites observed within the red cells were almost uniformly in one stage of growth, but the four cases observed showed all stages of the life cycle of the parasite, no single one of them, however, showing the entire life cycle. The younger forms of the estivo-autumnal parasite were similar in appearance to the young forms found in the peripheral blood, being small, hyaline rings, well defined and present-

ing, in the fresh smear, marked ameboid motion of limited extent. The other parasites were round or ring-like in shape, and contained more or less pigment in the form of very fine reddish brown granules, this pigment being but very slightly motile. In one case numerous segmenting bodies were observed, the segmentation always taking place within the red cell. The segments varied in number, the largest number counted being twenty-four, the smallest twelve. The peculiarity about the segments observed in this case was that each segment appeared to present the ring form which is usually found in the red cell at the earliest stage of infection. This appearance was so distinct that the red blood cell containing the segments seemed to be filled with small ring-formed estivo-autumnal parasites. The pigment in the segmenting bodies was collected either at the center or at one side, but none of the segments contained any pigment.

Another peculiarity noticed in the sections of the spleen was that no crescents could be found. As is well known, in cases of acute and chronic estivo-autumnal infection, the spleen generally presents in sections numerous crescents. The only explanation of the absence of crescents in these latent infections would seem to be that the parasites had not advanced, as yet, to the stage in which crescent formation was possible. Numerous pigmented leukocytes were observed containing the pigment in the form of minute grains and larger granules and clumps, together with a few nearly full-grown parasites. Very large white cells were observed, containing much pigment, and sometimes two or even more well formed parasites. Considerable free pigment was present in the same localities as noted in the tertian infections.

From the above description it will be seen that the estivo-autumnal parasite is capable of undergoing its entire human life cycle within the spleen, and in such numbers as not to be found in the peripheral blood upon repeated examinations.

*Liver:*—The pathological changes present in the liver were similar to those found in the same organ in the tertian



infections in every respect. No infected red cells were found, although a considerable number of melaniferous leukocytes were observed, together with some free pigment. The liver did not present macroscopically any change which would be indicative of a malarial infection.

The question at once arises, in studying sections of the organs in these latent infections, as to the reason for the non-appearance of the infected red cells in the peripheral blood. There was no difficulty in finding such cells in the sections of the spleen, and it would appear at first sight that it would be impossible for the number of infected red cells which were found in the spleen to be present there only, as apparently there is no reason why the red blood corpuscles containing the parasites should not circulate freely in the blood which passes through the spleen to other portions of the body. In considering this question it must be remembered that the number of infected red cells in the spleen was very markedly less than in more advanced latent cases, and immensely less than in the acute malarial infections. It is obvious therefore, that there is no reason why the infected red cells could not be present in the blood, but on account of their small number be very difficult to demonstrate even after a large number of examinations. It is a well known fact, that even in acute malarial infections, presenting marked symptoms of the disease, repeated examinations are often necessary, especially in the estivo-autumnal forms, to demonstrate even a single parasite, and I have often spent half an hour upon an examination in which the symptoms were perfectly typical without finding a parasite, and only found them after a number of careful examinations. Thus it will be seen that the infected red corpuscles are, in all probability, not in any way confined to the spleen, but are actually in circulation in the blood as in acute infections. This also is true of the melaniferous leukocytes, which were markedly in very much less number in these cases than they usually are in acute infections. Sections were made of all the other viscera in these latent infections, but in none of them could any

•

trace of malaria be discovered, except for very slight evidences of deposition of pigment.

The reason for the intensity of the malarial infection in the spleen is not hard to understand, but it is much more difficult to understand why the liver, rather than any of the other organs in the abdominal cavity, should have shown marked traces of the infection.

The chief point of value in the pathology of these cases is the fact that the malarial parasites, either tertian or estivo-autumnal, do undergo their entire normal human life cycle within the spleen, and that the time-honored theory that the spleen is the seat of the malarial infection is borne out by these examinations.

I have discussed elsewhere\* the proportion of cases of latent malaria, and the diseases which are apt to mask malarial infection, and will not touch on this subject here. These observations show that a malarial infection may exist in the human being, the parasites undergoing their normal evolution without producing any symptoms, and without an examination of the blood proving positive.

Most of these cases were present in the Hospital for several weeks, and had repeated blood examinations, were carefully studied clinically, and in none of them was malarial infection suspected. How long this latency could exist is, of course, a question, but that it can exist for a considerable period of time is conclusively proven by many instances occurring here of prolonged latent infection.

It is obvious that punctures of the spleen in the cases described would have resulted without doubt in the discovery of the malarial infection. This procedure, however, is dangerous even in experienced hands, and is certainly not advisable as a routine measure, or in cases such as these where no malarial symptoms are present.

In conclusion I will draw attention again to the fact that these observations conclusively prove that the malarial parasites may be present in the human body, may undergo their normal life cycle, without producing symptoms, and that they are practically localized in the spleen.

## Reprints and Translations.

### DRESSING STATIONS ON WARSHIPS.\*

FROM THE SPANISH OF DON JUAN REDONDO, MEDICAL OFFICER  
OF THE FIRST CLASS IN THE SPANISH NAVY.

By LIEUTENANT CHARLES NORTON BARNEY.

MEDICAL DEPARTMENT UNITED STATES ARMY.

**T**HE complete transformation which has taken place in naval architecture within the past thirty years has necessarily altered the conditions under which every branch of the service aboard ship functionates.

The recent advances in construction have thus far made the sanitary service of modern war vessels in certain essentials inferior to that of the older ships. The great floating fortresses of the present day do not afford their inhabitants, in peace such lodging as hygiene demands, and in war such conditions as are indispensable for the proper care of the wounded.

• In planning the location of batteries and turrets, of engines and boilers, the disposition of bulkheads, the distribution of torpedoes, the installation of steam, hydraulic and electric apparatus, the utilization of armor and protective decks, naval constructors seem almost to have forgotten that ships must be manned—in planning to increase the offensive power of the matériel and to protect the latter from injury they have disregarded the personnel.

The planning of places suitable for use during battle as dressing stations for the wounded has been unjustifiably disregarded.

Each of the old sailing frigates and line-of-battle ships had amid ships under the waterline, a spacious and well ventilated

\*Enfermerías de Combate en los Buques Modernos, por Don Juan Redondo. Primer Médico de la Armada. XIV Congreso Internacional de Medicina, Sección de Higiene, Medicina y Cirugía Militar y Naval. Madrid, 1903.

sick-bay whither the wounded could easily be carried during action to receive such attention as their condition called for ; but when steam was substituted for sails, the engines, boilers and coal bunkers absorbed that part of the ship, and the sickbay, which until then had so judiciously been installed amidships, was displaced forward. From that moment sickbays lost their size and advantageous position, and were reduced to cramped, dark, unventilated places, difficult and even dangerous of access, and almost impossible to evacuate in case the ship should have to be abandoned in a hurry.

Had we not by actual experience been convinced of the absolute necessity of suitable dressing stations we should doubt it at seeing the profound indifference with which this subject is regarded by naval constructors and other officers, even the most conscientious and foresighted, who are absorbed in the solution of other problems which seem more important to them, though not to us.

It is the experience of medical officers that whenever for any reason ships have not been provided with dressing stations before entering into battle it has always been necessary to improvise such stations after the engagement has begun.

But improvisations are at best but makeshifts. For success in war it is necessary that every detail should be the subject of much study and every need be foreseen in time of peace. A question of so much importance as this one of proper provision for the wounded ought not to be left to the mercy of individual initiative, but should be controlled by appropriate regulations.

However radical the changes which progress in naval architecture may introduce into the various departments of activity aboard ship the fundamental principles which govern these services, remain unchanged. Today, as in past centuries the dressing station ought to unite three essential conditions : 1st, it should be at such a point, which might be called strategic, that the wounded can be brought to it without great difficulty ; 2nd, it should be protected from the enemy's fire ; 3rd, it should have direct communication of its own with the decks and batteries.

Before the days of steam, when sickbays were situated amid

ships, they fulfilled the first of these requirements, but displaced by the engines they lost one of their most desirable characteristics, that of being equidistant from the extremities of the ship. This evil can be overcome by having at least two dressing stations on each ship—one in the bow and one in the stern. Though this solution of the difficulty involves division of the sanitary personnel and matériel it is the only available means by which we can care for the wounded under proper conditions without obliging them to traverse the greater part of the ship at critical moments of the fight when the attention of the combatants ought not to be distracted from their proper duties.

Furthermore, the complete isolation in which the various divisions of a modern war ship remain during the battle makes it desirable that there should be more than one dressing station. Before firing begins the doors and passage ways between the various sections of the ship are hermetically closed, so that the five or six hundred men who form the crew of a battleship or cruiser of the first class, distributed in batteries, turrets, engine-room, fire-room, torpedo-chambers, magazines, etc., have as their only means of intercommunication a speaking tube or a telephone wire, the utility of which at critical moments is problematical. Judging from my observation in the naval battle of Cavite, I believe that with a single dressing station it is impossible to care for all the wounded with due promptness under such conditions.

Increasing the number of the dressing stations would involve increasing the sanitary personnel. The sad experience we acquired in our war with the United States, the various occasions on which in other wars medical officers have been killed or wounded during action, leaving men and officers without surgical aid, even during entire days, and the enormous number of the casualties which a single shot has produced in many distinct instances, justify such an increase of the sanitary personnel, whether the number of dressing stations be increased or not.

Is not the remembrance of what occurred in the dressing station of the "Cristina" still fresh in your memory? Can we ever forget what happened in the dressing station aboard the "Austria," or the wounding of the surgeon and the death of the

assistant surgeon of the "Teresa," the wounding of the assistant surgeon of the "Viscaya," or the explosion in the turret of the "Oquendo" ?

Who has not heard of the case of the "Matsushima," in the China-Japanese War, where the explosion of a 30.5 cm. shell within the battery, causing the explosion of a nearby magazine, occasioned one hundred casualties, thirty killed and seventy wounded? Who does not know of the analogous explosion in the dressing station of the "Heiyei," which produced forty casualties, fourteen killed and sixteen wounded, occasioned the death of both the two medical officers, killed or wounded absolutely all of the sanitary personnel, and destroyed all of the surgical instruments and dressings ?

In all these cases we have to consider, apart from the great number of the wounded and the severity—the brutality—of their injuries, the time required for the application of even the most needed dressings. On account of this time element it would have been impossible for a single surgeon to carry out even the purely vital indications.

The allowance of medical officers to each battleship and first-class cruiser should be not less than three.

In spite of the essential differences between naval and land battles and between the nature of the wounds in each, yet close analogies exist between the two in everything which pertains to the organization of the sanitary service. As the sanitary service of an army in battle is divided into the service of the front and the service of the rear, and is sub-divided into the service of the firing-line, of the dressing stations, of the field and base hospitals, so in ships and squadrons there are analogous lines of surgical assistance, which ought to be thoroughly systematized and perfected.

It is impracticable for the medical officer to leave his post, come up on deck, go to whatever points men happen to be wounded, and treat them there at their battle stations. After the battle has begun there is no means of knowing what is going on in the several compartments, except the speaking tube and the telegraph or telephone, all of which are easily deranged by the slightest accident.

Though the first aid packet is unquestionably of great use in land battles it has comparatively little value in warfare at sea on account of the great severity which characterizes the injuries received in naval engagements and the consequent necessity for skill in treating them. In our opinion the utility of the first aid packet does not consist so much in the fact that with it a man can dress his own wounds, or a comrade can dress them for him, as in the fact that it gives assurance that the sanitary personnel will find ready at hand on the patient himself the materials indispensable for dressing his injuries. Convinced that as Nussbaum says, "the fate of the wounded man lies in the hands of him who applies the first dressing," we consider it more desirable that the dressing be done skillfully, even if late, than that it be done early though in a bungling manner.

The combatants ordinarily, not only do not possess the skill necessary for the application of first aid in these severe injuries, but while the fighting is in progress they have their attention fully taken up by their own proper duties and give little heed to the wounded, except to carry them to the nearest first aid or dressing station.

For the same reasons there is little to be gained by distributing a number of surgical emergency chests throughout the ship before battle; unless at each chest there be stationed somebody who is skilled in its use—an officer, noncommissioned officer or private of the sanitary corps.

Before the battle of Cavite, on board the cruiser "Isla de Cuba," I established a first aid station in the engine room and another in the orlop deck, and supplied both with an abundance of dressing material arranged in such a manner that I thought it could easily be used by anybody without the slightest knowledge of surgery. I placed one of the aid stations under the charge of the chief machinist and the other under the charge of the purser [contador]. And what was the result? The natural one, and the one which will always happen in like cases. In spite of the fact that in both places men received wounds, which, fortunately were of such a nature as to be most easily dressed, they remained untreated until they reached the sickbay and awaited their turns.

The dressing stations are the proper posts for the medical officers during action. All surgical instruments and dressings should be gathered together there to be safe from destruction. According to our conception the dressing stations should not be operating rooms fully equipped for the performance of every class of surgical work, but simply shelters where the wounded can be withdrawn from danger of new accidents and can at the same time receive such surgical assistance as is necessary for the preservation of their lives.

All operations which are not directly necessary in order to save life should be deferred until after the battle and should be performed in the regular operating room of the ship, if the vessel be separated from the rest of its squadron, or in the ambulance or hospital ship, which should accompany every fleet in time of peace as well as in war. In them only can medical officers of the navy be sure of performing really successful work, subject to the vigorous principle of asepsis, which are the foundation of the brilliant results achieved by modern surgery.

This conception requires that the dressing stations be shielded by the protective deck or by the armor or be in turrets. In the German navy regulations prescribe that the dressing stations shall be beneath the protective deck. The fact that the location is prescribed rather than left to individual initiative and that the prescribed location is a protected one, is a step in the right direction. But a dressing station established in such a place is hot, ill ventilated and inaccessible. In a few foreign navies we have noticed a beginning tendency, which may be considered the second stage in the evolution, to seek the defense of the dressing stations not in the protective deck but in armor: and with this tendency we are in heartiest accord.

The ideal place for the dressing stations is above the protective deck, at or near its union with the vertical armor on battleships, and in turrets or redoubts on unarmored vessels.

The two or three dressing stations of a ship should in conjunction be of such capacity as to accommodate easily ten per cent of the crew, in addition to the sanitary personnel and matériel.



They should be provided with electric and supplementary lighting, artificial ventilation, and an abundance of drinking water.

To guard against explosions no steam pipes nor ammunition lifts should pass through them.

They should have their own exclusive means of direct communication with the upper decks, those parts of the ship which being most exposed supply the greatest number of casualties. To expect that the ammunition hoists could be used for moving the wounded during action would be as absurd as to ask that artillery caissons be used to transport the wounded during land battles.

Medical officers of the navy should urge, in the interest of the combatants, that the subject of suitable places for use during action as dressing stations be considered, not in the rush of preparation for battle, but when the constructing engineer in the quiet of his office is drawing the first plans for the projected ship.

#### THE WOUNDED IN NAVAL WARFARE.

IN the fighting line only "first aid" should be rendered to the wounded, and for this purpose dressing stations should be established where possible and convenient. One medical officer in each ship would be sufficient for the supervision of this work, and his sick-berth staff should be reinforced by the chaplain and accountant staff, for all of whom thorough instruction and examination in these duties should be made compulsory. The medical officer and his assistants must be free to move about the ship as expeditiously as they can, and to wherever they are most urgently needed, as, for instance, to a case-mate wrecked by a shell. A central dressing station would naturally be of the greatest assistance, but it must be regretfully admitted that very little can be hoped for in this direction, in view of the very complicated arrangements of modern ships of war.—*Dr. Philip Randall in the Journal of the Royal United Service Institution.*

## THE NEW UNIFORM OF THE DANISH ARMY.

By KAPTEIN HANS DAAE,

SANITARY SERVICE OF THE ARMY OF NORWAY,

KRISTIANIA, NORWAY.

A COMMISSION consisting of combatant, commissary and medical officers of the Danish Army has during the last two years been investigating the question of the reduction of the weight of the clothing and equipment of the soldier. Numerous experiments have been made, both at home and in the field. The home experiments included investigations of the heat conducting power of the various materials and uniforms and were made by Major Hempel who employed eighteen different materials with five combinations according to the five uniforms experimented with. Experiments were made with the hot water cylinders of Wiener and with the enlisted men themselves. In the latter experiments, the temperature was taken at different parts of the body upon the soldiers, who during the winter wore the several uniforms. Major Hempel found that he could put together a uniform with almost the same warmth but with decidedly less weight than the old uniform.

Captain Jensen of the infantry, experimented with a dress jacket, wide and fitting loosely over the breast and abdomen. It was demonstrated that soldiers wearing this uniform could endure long and severe marches much better than with tight fitting garments. The heat preserving power of the loose fitting uniform is greater in cold weather and less in hot weather.

Experiments were also made with clothes made of a very light and porous woolen stuff. This latter is to be worn during the summer, the dress jacket during the spring and autumn, and both of them,—the dress jacket outside,—during the winter. During the winter maneuvers, the unanimous opinion of the soldiers was, that this latter combination was warmer without the cloak than the ordinary uniform with the cloak.

The kepi was found to be a most practical head cover. It was made of gray impregnated light material with one ventilator on either side under the crown and with numerous air passages through the thin cork strap between the sweat strap and the cloth. In addition to this a cap was recommended, to be drawn over the kepi and cover the ears, cheeks and neck.

A laced boot was found to be the most practical foot covering on the march. The sole consists of three layers: the upper, a cork sole adapted to the shape of the foot; the middle a layer of thin strong leather; and the outer, a half sole of thick heavy leather. The foot and leg of the boot is composed of gray waterproof canvas. The foot however is supplied with an upper leather. All of the leather is tan. The legs are thirty centimeters long.

The color of the uniform is light gray which was thought to be the most difficult of observation in the field, and even when observed, the outline of the soldier is rather uncertain. In consequence of this, estimation of distance is difficult, the estimate being liable to be in excess of the actual distance. The weight of this new uniform is five kilograms less than the old one.

#### CORDITE INTOXICATION.

SMOKELESS powder, according to Major J. W. Jennings, D.S.O., comes to the front as an intoxicant of no mean qualities. Tommy Atkins in the recent Boer hostilities, in considerable number, resorted to it either by ingestion or inhalation. Cordite seems to have an effect all its own, partaking of the qualities neither of nitro-glycerine nor gun-cotton. The first effect is a marked tendency to extreme garrulity for two or three hours followed by a sound sleep, and this by a splitting temporal and occipital headache of sometimes thirty-six hours duration. Cordite and beer taken together was said to make a man "as mad as a man can get without becoming absolutely a raving lunatic," although it was found that beer was almost essential to sober a person up after free indulgence in cordite. Major Jennings reports no permanent effects from its use, but doubtless its continued employment will hereafter be discovered to have a very material effect upon the system.

# Medico-Military Index.

## MEDICO-MILITARY ADMINISTRATION.

**Benoit (C. P.)** [Organization of improved vehicles for transportation of the wounded during the manoeuvres of the medical section of the 1st Army Corps.] *Arch. de méd. et. pharm. mil.*, Par., 1903, xlii, 133-145.

**Buraczynski (Andreas.)** [Directions for bearers of the wounded.] 12°. Vienna, 1903.

**Gergo (S.)** [The question of the first-aid package.] *Militärarzt*, Wien, 1902, xxxvii, 106-108.

**Giles (P. B.)** Training of volunteer bearers and the position of regimental medical officers. *Brit. M. J.*, Lond., 1903, ii, 409-412.

**Hathaway (H.)** Some notes on a mounted bearer company. *Brit. M. J.*, Lond., 1903, ii, 406-408.

**Jerzabek (A.)** [On the efficiency of the hospital corps and litter-bearers on the battle-field.] *Allg. mil.-ärztl. Ztg.*, Wien, 1903, 44-50.

**Kiesling (F.)** [Duties of volunteer ambulance corps in time of peace.] *Krankenpflege*, Berl., 1902-3, ii, 835-843.

**Laval (E.)** [Improvised means of removing the wounded from the field of battle.] *Caducée*, Par., 1903, iii, 148-150.

**Pignet.** [Practical instruction of stretcher-bearers.] *Caducée*, Par. 1903, iii, 187.

**Port.** [Apparatus for transportation of the severely wounded.] *Illust., Monatschr. d. ärztl. Polytech.*, Berl., 1903, xxv., 65-70.

**Port.** [On the necessity of long distance transportation of the severely wounded in war.] *Ztschr. f. Krankenpfl.*, Berl., 1903, xxv, 226-235.

**Razdolski (V. P.)** [On the large manoeuvres under Kursk in 1902.] *Voyenno-med. J.*, St. Petersburg, 1903, ii, med.-pt., 337-340.

**Rühlemann.** [Principles for the instruction of volunteers in bearing the wounded.] 14. ed. 12°. Dresden, 1903.

**Russia.** [Order to the War Department, 1903, No. 101. List of the salaries of army surgeons serving in Cossack troops and receiving salaries from the military funds of the Cossack troops.] *Voyenno-med. J.*, St. Petersburg, 1903, ii, offic. pt., 34-42.

**Sagranti.** [Professional and technical guide for the use of members of the Societies for assistance to the sick and wounded of the land and sea forces.] 12°. Paris, 1903.

**Sheen (W.)** Suggestions regarding the personnel, equipment, and training of medical units attached to volunteer infantry brigades. *Brit. M. J.*, Lond., 1903, ii, 412-415.

**Stanistreet (G. B.)** A report upon hospital arrangements on board transports. *J. Roy. Army Med. Corps*, Lond., 1903, i, 5-31, 1 pl.

**Stephens (G. A.)** Poverty of attraction for men to become stretcher bearers, and the consequent inefficiency of that section. *Brit. M. J.*, Lond., 1902, i, 408.

**Warnecke (M.)** [Contribution to the study of the best kind of lighting to be placed at the disposal of litter-bearers in moving the wounded at night.] *Arch. de méd. et pharm. mil.*, Par., 1903, xlii, 125-132.

### MEDICO-MILITARY HISTORY AND DESCRIPTION.

Report on the medical history of the campaign, China field force, 1900-1901. *Army M. Dep. Rep.*, Lond., 1903, xliii, 381-410.

**Boak (G. D.)** Army dental surgeon and his work in the Philippines. *Dental Reg.*, Cincin., 1903 lvii, 301-310.

**Demmler (A.)** [Medical service in the Greek and Roman armies.] *Progrès méd.*, Par., 1903, 3. s., xvii, 441-443.

**Hamy (E. T.)** [Our first army surgeons; historical note on the origins of military surgery in France.] *France m'd.*, Par., 1903, i, 237.

**Hippius (A.)** [On the present condition and the pending reform of military medicine in Russia.] *Deutsche med. Wchnschr.*, Leipz. u. Berl., 1903, xxix, 612-614.

**Hochheimer.** [The rebuilding of the Kaiser Wilhelms Akademie.] *Deutsche med. Wchnschr.*, Leipz. u. Berl., 1903, xxix, 412-415.

**Kolyago (K.)** [First medical aid on the ruins of Andizhan.] *Voyenno-med. J.*, St. Petersburg, 1903, ii, med. pt., 245-264.

**Neumann.** [Progress of medico-military science and its relation to the progress of medicine in general.] *Reichs-Med.-Anz.*, Leipz, 1903, xxvii, 283.

**Sickinger (A.)** [On the necessity of dentistry in the army.] *Krankenpflege*, Berl., 1902-3, ii, 819-826.

**Talayrach.** [Modern Germany and its recruiting system.] *Rev. d'hyg.*, Par., 1903, xxv, 453-464.

**Thomas (L.)** A surgeon's notes with the naval brigade, China. *Brit. M. J.*, Lond., 1903, ii, 398-406.

**Yevseyeff (R.)** [Shubkov camp in 1902.] *Voyenno-med. J.*, St. Petersburg, 1903, ii, med pt., 95-124.

### MILITARY HYGIENE.

Ages, heights, weights, and chest measurements of all recruits finally approved for service during the year. *Army M. Dep. Rep.*, 1901, Lond., 1903, xliii, 40-44.

**Arentz (B.)** [Some researches on tuberculosis in our garrisons.] *Norsk. Tidsskr. f. Mil.-Med.*, Kristiania, 1902-3, vii, 120-128.



**JOHN MORGAN, M.D., F.R.S.,  
DIRECTOR GENERAL AND PHYSICIAN IN CHIEF OF  
THE AMERICAN HOSPITAL, 1775-1777.**

## Editorial Department.

### The Surgeon Generals of the United States Army

#### II. JOHN MORGAN, M.D., F.R.S., DIRECTOR GENERAL AND PHYSICIAN-IN-CHIEF OF THE AMERICAN HOSPITAL, 1775-1777.

THE chaotic condition of the medical affairs of the American forces, after the dismissal of Benjamin Church, demanded a strong and experienced hand, for which reason several candidates from the medical officers already in the field were passed over and the command tendered to Dr. John Morgan of Pennsylvania. Born in Philadelphia in 1735, he was prepared for professional study by a thorough literary course, graduating with the highest honors at the College of Philadelphia in 1757. During the latter portion of this period and afterward, he also pursued the study of physic under Dr. John Redman, upon the completion thereof entering the provincial forces of Pennsylvania as a surgeon with the rank of Lieutenant and serving in the operations against the Indians for a number of years with great advantage to the service.

In 1760, he repaired to Edinburgh and under the especial patronage of the Hunters, acquired the degree of M.D. in 1764, presenting and defending a remarkable thesis upon the Formation of Pus. He then put in a winter in Paris, where he won new laurels and by a successful and elegant injection of the kidney secured admission to the Academy of Surgery. Upon his return to England, he was admitted to membership in the College of Physicians of Edinburgh, granted the license of the College of Physicians of London, and honored by election as a Fellow of the Royal Society.

During his stay abroad he became profoundly impressed with the need of greater facilities for medical education at the home and in conference with Dr. William Shippen Jun. formulated the plans for an American medical school, which, soon after his return in 1765, materialized under his fostering care into the medical school of the College of Philadelphia, which, as the medical department of the University of Pennsylvania, has in the twentieth century attained a position beyond his fondest dreams. Dr. Morgan occupied the chair of Theory and Practice of Medicine in the institution for many years and was thenceforward a conspicuous figure in the intellectual and professional life of the country

On the 17th of October, 1775, he was elected by Congress, Director General and Physician-in-Chief of the American Hospital, and at once reported to General Washington at Cambridge. Here he was confronted by a problem appalling in the perplexity of its details and discouraging in the difficulty of its solution. His work was creative as well as reformatory. There was no definite medical organization, many of the medical officers were incompetent, the hospitals were overcrowded and over-officered, the wards were cumbered with numerous cases which should have been under the care of regimental surgeons, the supplies were poor in quality and insufficient in quantity, and typhoid, dysentery, remittent and smallpox were rife among the troops.

Dr. Morgan at once introduced system into the organization of the medical department and into the hospital arrangements; instituted a new examination for medical officers by which the inefficient were weeded out; transferred numerous surgeons and surgeon's mates to regimental duty; returned great numbers of patients to their regiments; largely reinforced the inadequate medical supplies by the results of appeals to the charitable; and by the institution of hygienic and sanitary measures materially reduced the sick rate of the army.

When Washington removed his headquarters to New York, Morgan accompanied him, and from that point of vantage continued his work of improving and developing his department. This was forwarded by the passage of an act of Congress in July



1776, more clearly defining the office of Director General, definitely fixing the number of the hospital surgeons and mates at one of the former and five of the latter to every five thousand men, and authorizing the employment by directors of hospitals of such storekeepers, stewards, matrons and nurses as might be necessary. A scheme of inspections was instituted and a system of properly accountability was established; arrangements for the purchase of supplies were made and regimental surgeons were prohibited from drawing upon the hospital for them. Hospital surgeons and mates were to take rank of regimental surgeons and mates and their pay was fixed at one and two thirds of a dollar a day. The three latter provisions created much feeling among the regimental medical officers who could see no reasons for the higher rank and pay of the staff, while the provision against drawing upon the hospitals for supplies produced at once a most serious situation. Dr. Morgan took this matter up, and, after a conference with the regimental surgeons, codified a set of hospital regulations which materially relieved the tension and clarified the whole situation, perhaps the most important feature being the establishment of the equivalent of the present "hospital fund."

Congress had imposed upon the Director General the duty of purchasing supplies, a factor of his work which added materially to the labors with which he was already overburdened. After numerous efforts to adjust this important duty, Congress finally authorized the appointment in August, 1776, of a "druggist" to take charge of the purchasing department and designated Dr. William Smith of Philadelphia as the first medical supply officer.

The enlargement of the army and the establishment of other military commands rendered necessary the appointment of chief medical officers with them. Dr. Morgan quite logically assumed that he as Director General on the staff of the Commander-in-Chief was the chief medical officer of the entire service. His position was however not sustained by Congress, which extended to the directors of departments a degree of autonomy which contributed sadly to the confusion of the service of the sick, and greatly embarrassed the medical administration of the army. This was particularly pronounced upon the northern frontier, where

Dr. Samuel Stringer of Albany had upon the nomination of General Schuyler been appointed by Congress "Director of the Hospital and Chief Physician in the Northern Department." Dr. Stringer appears to have been more of a politician than a surgeon, and his independence and incompetence were the cause of continual friction with the Director General. While the situation was particularly strained in this case, however, it did not fail to be present though in a less degree in all the departments.

As hostilities continued, the public clamor against the medical department, which seems inseparable from the early stage of all military operations, arose to such an extent as to demand some recognition by the governing authorities. A calm survey of the situation, with the perspective of only a few month's later, showed that the condition was in spite of and by no means because of the management of the Director General. But public opinion demanded a sacrifice and Dr. Morgan was selected as the victim. Manfully declining to resign in response to a request for his papers he was summarily dismissed on the 9th of January, 1777.

"As Director General of the Army," says Harvey Brown, "Dr. Morgan evinced great administrative ability, untiring industry often under the most discouraging circumstances, a 'most amiable and exemplary tenderness' toward the sick, and a strict tenacity for his own dignity and the rights of the corps of which he was the chief. The errors into which he fell, grew out of his desire for the increased efficiency of the hospital—the failures of his administration were the result of causes beyond his control. When he had finally gone from it, the army found out how great a mind and true a friend had been lost to its ranks; and all, from the Commander-in-Chief to the junior subaltern, united in their testimony before the congressional committee to relieve him from the aspersions cast upon his character by the malevolence of his enemies."

Declining to endure the stigma cast upon him by his dismissal, Dr. Morgan prepared and extensively circulated an elaborate "vindication of his public character in the station of Director General." This document was referred by Congress to a special

committee which after carefully sifting all the evidence, made a report in June, 1779, completely acquitting him and explicitly declaring in a published resolve that he "did conduct himself ably and faithfully in the discharge of his office."

Thus exonerated, Dr. Morgan retired to his home and resumed the practice and teaching of medicine interrupted by his military duties. His extraordinary acquirements here had an opportunity for their full sway. He read extensively, not only in medicines but in the classic tongues. The great Morgagni wrote in a copy of his works which he presented to Dr. Morgan, "*Affini suo, medico praeclarissimo, Johanni Morgan, donat auctor.*" As a friend he was faithful and unfailing; as a student he was indefatigable and brilliant; as an administrator he was systematic and energetic; and as a physician he was tenderness and skill in person. Honored and beloved at home and abroad, his useful and distinguished career was brought to an end at his Philadelphia home on the fifteenth of October, 1789, at the age of fifty-four.

JAMES EVELYN PILCHER.

#### THE ST. LOUIS MEETING IN 1904.

IN fixing upon St. Louis as the location of the thirteenth annual meeting of the Association of Military Surgeons of the United States, the Executive Council has complied with the clearly manifest wish of the membership. The Louisiana Purchase Exposition will cause a universal reduction in transportation and will in itself be an attraction which will influence the attendance of a large number of visitors. The middle of October, selected as the date of the meeting, is the period when the exposition will be at its best and when the climate of St. Louis is always the most agreeable. The sessions of the meeting are to be held in excellent apartments, furnished by the Exposition authorities upon the grounds, and attractive social headquarters will also be furnished within the gates of the fair. The scientific work will be confined to the six mornings of the week fixed upon, the remainder of each day being left open for sight seeing, securing a rare combination which can not but inure to the great satisfaction of those attending the meeting.

## Reviews of Books.

### VAUGHAN'S PRINCIPLES AND PRACTICE OF SURGERY.\*

THE need of a concise textbook embodying the essentials of Surgery in a compact and complete form is constantly present both with student seeking the groundwork upon which to base his future professional work, and the practitioner, looking for a convenient and readily available reminder of facts dimmed by the distraction and confusion of active practice. The work of Assistant Surgeon General Vaughan is eminently qualified to meet this demand. Fully up to date in all its features, all non-essential matter has been carefully excluded. The principles of surgery are given with accuracy and succinctness and the practice is presented practically and unencumbered by obsolete or theoretical procedures. It is to be observed that it is confined to the field of surgery proper, ophthalmology, otology, laryngology, gynecology and similar specialties being relegated to the special works devoted to them. The author makes no effort to exploit special theories of his own or others but gives to the profession a clear, well-balanced presentation of a science that is inclining toward excessive elaboration rather because of the disinclination of the surgeon to entirely let go of the old while reaching out for this new. By avoiding this error and by infusing his well known judgment and scholarship into his work Dr. Vaughan has produced a distinct advance in surgical literature as was to be expected from so experienced a teacher and so accomplished a surgeon.

**\*The Principles and Practice of Surgery.** Designed for Students and Practitioners. By GEORGE TULLY VAUGHAN, M.D.(Univ. of Va.), Assistant Surgeon General in the Public Health and Marine Hospital Service. 8vo. pp. xiii. 569; 281 illustrations. Philadelphia and London, J. B. Lippincott & Co., 1903.

A TEXT BOOK OF CLINICAL ANATOMY.\*

THE keynote of the active professional man today, is the practical application of his knowledge to the subject under consideration. This application is as valuable to the student as to the busy doctor. The author realizing these conditions has produced a work that strongly appeals to these classes, and has made the practical application of anatomy to the bedside, clinic and operating room an easy matter. The methods of illustrating are novel, the deeper structures being traced in outline on the surface of the body and then photographed thus giving the practitioner a bedside picture with the skin covering the tissues. The book is a desirable one, the text, illustrations and binding being of unusual excellence.

A. R. ALLEN.

TYSON'S PRACTICE.†

MEDICINE is a progressive science and no stronger proof of this fact can be adduced than the vast number of changes in the third edition of Professor Tyson's valuable Practice of Medicine. Although only two years have elapsed since the issue of the second edition the revision of the work has been so complete as to require a resetting of the entire book. The revision has consisted of an actual correction of the text, not of the interpolation of new paragraphs or sentences and has consequently involved but little expansion, the increase amounting to but eighteen pages. The sections on malarial and yellow fevers have been subjected to particularly thorough revision and are thoroughly up to date. The mention of any particular subject is invidious for what can be said of one can be said of all. The book is a complete, well-rounded and concise discussion of the subject to which it is devoted. A new style of binding renders it a most attractive piece of book-making.

\***A Text Book of Clinical Anatomy.** For Students and Practitioners. By DANIEL N. EISENDRATH, A.B., M.D., Clinical Professor of Anatomy in the Medical Department of the University of Illinois (College of Physicians and Surgeons). Handsome 8vo, 515 pages, with 153 illustrations, a number in colors. Philadelphia, New York, London; W. B. Saunders & Company, 1903.

†**The Practice of Medicine.** A Textbook for Practitioners and Students with special reference to Diagnosis and Treatment. By JAMES TYSON, M.D. Third Edition. Imp. 8vo; pp. xviii, 1240; 134 illustrations. Philadelphia P. Blakiston's Son & Co., 1903.

## THE NEW YORK MEDICAL DIRECTORY.\*

**T**HIS valuable annual index to the Medical profession of New York, New Jersey and Connecticut continues to present the useful characteristics for which it has long been so highly regarded. A feature which renders it particularly useful is the employment of different colored papers for the different sections of the book, rendering it much easier of consultation. We look in vain for lists of the Medical Officers of the National Guard of the several states treated of, and hope that so useful an addition may be made in next year's edition.

## THE COLLECTED WORKS OF AUSTIN FLINT.†

**I**N collecting into accessible form the many valuable contributions to periodical literature which he has made during half a century of strenuous professional work, General Flint has placed his contemporaries and his legion of followers under a genuine debt of gratitude. Aside from his encyclopedic Physiology of Man, his Textbook of Human Physiology and his Manual of Chemical Examination of the Urine in Disease, the handsome volumes before us contain practically all the published works of their distinguished author from the middle of the last century to the present time, and form a professional biography of the most picturesque and effective type. Following the author's name on the title page also is a most interesting biographical feature,—a list of the official professional positions held by him during his long and conspicuous active career, from which we learn that he was an Acting Assistant Surgeon in the U.S. Army from 1862 to 1865 and Surgeon General of the State of New York from 1874 to 1878. In the text we find his Monyhton prize essay on a "New Excretory Function of the Liver," his original report on his discovery of "Stercorin," the first demonstration of the fact that when ox-

\**The Medical Directory of New York, New Jersey and Connecticut.* Volume V. Published by the New York State Medical Association, 64 Madison Av., New York: 1903; 12 mo.; pp 1050.

†*Collected Essays and Articles on Physiology and Medicine.* By AUSTIN FLINT, M.D., LL.D. 2 vols.; 8vo; pp.xxviii, 465 and viii, 518; New York, D. Appleton & Co., 1903.

idation represented by carbon dioxide and nitrogenous excretions is not sufficient to supply the heat required, water is produced in the body, his great address on "Fever" before the Ninth International Medical Congress, and numerous papers which not only exerted a profound influence at the time of their publication, but which are equally pertinent to professional and public conditions at the present day. Indeed, the whole work comprises one of the most valuable collections of papers ever issued from the medical press.

---

#### SURGICAL DISEASES OF THE ABDOMEN.\*

**T**HIS work treats of subjects that have been long wished for by the profession, and heretofore found only in monographs or in the current medical journals. It takes in all the surgical diseases of the abdomen and presents the differential diagnosis of each disease in a logical manner, calling attention to the significant points of pain, so often present in diseases of this region; clearly presenting the cardinal symptoms, so that the reader is never in doubt as to his duty in each individual case.

The author gives the latest and most up to date references from which he quotes freely, especially of the rarer conditions and diseases.

The keynote of the book is diagnosis. The author believing that the operative technic is sufficiently given in the numerous text books devoted to surgery, and that it is quite enough to indicate the proper surgical procedure. The book is the result of the author's teaching and practical work in abdominal surgery and of his necessity of relying largely upon journal literature for guidance. The author has found a new field in surgical literature and has given the profession a book that appeals strongly to both physician and surgeon as it covers a region in which both are greatly interested.

A. R. ALLEN.

---

\**Surgical Diseases of the Abdomen*, with Special Reference to Diagnosis By RICHARD DOUGLAS, M.D. 8vo. pp. 883, with 20 full page plates. Philadelphia, New York and London. W. B. Saunders & Co., 1903.

## DORLAND'S MEDICAL DICTIONARIES.\*

THE quick succession of several editions of Dr. Dorland's dictionaries indicates a high degree of appreciation of their merits by the profession. The pocket dictionary continues in even a higher degree than heretofore to be a *multum-in-parvo*, and the coming generation of students will find it, as have their predecessors, always a friend in need.

The larger work, the "American Illustrated" is a superb specimen of book-making, and reflects the highest credit upon editor and publisher alike. In this, the third edition, several hundreds of new terms that have been added to the vocabulary of medical sciences have been incorporated and clearly defined. The entire work, moreover, has evidently been subjected to a careful revision, and many of the tables, notably those of Acids, Bacteria, Stains, Tests, Methods of Treatment, etc., have been amplified, and their practical value greatly increased.

The constant mutation of medical science renders this rapid succession of editions of high value in the opportunity afforded of such frequent revision, and adds materially to the usefulness of the works.

• **\*The American Pocket Medical Dictionary.** Edited by W. A. NEWMAN DORLAND, M.D., Assistant Obstetrician to the Hospital of the University of Pennsylvania. Fourth Revised Edition, Greatly Enlarged. Containing the pronunciation and definition of the principal words used in medicine and kindred sciences; 12mo; 566 pages and 64 extensive tables. Philadelphia, New York, London: W. B. Saunders & Company, 1903. Flexible leather, with gold edges.

**\*The American Illustrated Medical Dictionary.** For Practitioners and Students. A Complete Dictionary of the Terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, and the kindred branches, including much collateral information of an encyclopedic character, together with new and elaborate tables of Arteries, Muscles, Nerves, Veins, etc.; of Baccilli, Bacteria, Micrococci, Streptococci; Eponymic Tables of Diseases, Operations, Signs and Symptoms, Stains, Tests, Methods of Treatment, etc., etc. By W. A. NEWMAN DORLAND, A.M., M.D., editor of the "American Pocket Medical Dictionary." Third Edition, Thoroughly Revised. Handsome large octavo, nearly 800 pages, bound in full flexible leather. Philadelphia, New York, London: W. B. Saunders & Company, 1903.



# Index.

- A**BDOMEN, Gunshot wounds of the, 255.  
 Abdomen, Douglas' Surgical Diseases of the, Review of, 409.  
 Acting Assistant Surgeon of the Army of the United States. 121.  
 Sternberg on, 326.  
 Adams, Lieutenant Colonel William Arnold, Memoir of, 87.  
 Aguirre, Lieutenant Colonel Agustin, at Twelfth Annual Meeting, 5.  
 Read paper at twelfth annual meeting, 14.  
 Decoration of with Insignia of Association. 19.  
 Ainslie and Grabow, Vote of thanks to 25.  
 Ambulance for Mounted Troops, 134.  
 Ambulances in China Expedition, Comparison of, 106.  
 AMES, Major AZEL. Remarks on a Public Service Medical School, 50.  
 The Acting Assistant Surgeon of the Army of the United States, 121.  
 Ames, Major Azel, Read paper at twelfth annual meeting, 16.  
 Anatomy, Review of Eisendrath's Clinical, 407.  
 Ancient and Honorable Artillery Co., Courtesy of, 62.  
 Vote of Thanks to, 24.  
 Army Experience in Celiotomy for Gunshot Wounds, 261.  
 Medical Department Organization, 325.  
 Medical Reserve Corps, 330.  
 Medical School, 37.  
 Surgeon Generals of, Biographies of, 321, 401.
- ARNOLD, HERBERT A., Treasurer's Report, 10.  
 Arnold, Major Herbert A., Note upon Work of, 72.  
 Re-Elected Treasurer, 21.  
 Treasurer, Vote of thanks to, 25.  
 Association, Minutes of Twelfth Annual Meeting, 1.  
 Attendance at Twelfth Annual Meeting, 1  
 Automobile Club Massachusetts, Vote of thanks to, 24.  
 Excursion, Start of, 64.
- B**ABIN, Surgeon H. J., Yellow Fever on the Marion, 220.  
 Badge of Boston Meeting, 66.  
 Baldwin, J. F., Celiotomy in Gunshot Wounds, 267, 279.  
 Bancroft, General W. A., Vote of thanks to, 24.  
 BARNEY, Lieutenant CHARLES NORTON, Circumcision and Flagellation among the Philipinos, 158.  
 Dressing Stations on War Ships, 389.  
 Barton and Wells' Thesaurus of Medical Words and Phrases, Review of, 176.  
 BATES, Governor JOHN L., at Twelfth Annual Meeting, 5, 6.  
 The Commonwealth of Massachusetts, 27.  
 Bates, Governor John L., Vote of thanks to, 24.  
 Bathing in the Philippines, 147.  
 Battle Field, First Dressing on, 331.  
 Protection of non-combatants and wounded on, 361.

- Bed Litter for Tropical Service, 149.
- Bell, Captain Robert E., Read paper at Twelfth Annual Meeting, 18.  
Vote of thanks to, 24.
- BEYER, Surgeon HENRY G., Remarks on a Public Service Medical School, 44.
- Beyer, Surgeon Henry G., Read paper at Twelfth Annual Meeting, 16.
- Biography, Medico-military, Index of, 316
- BLOOD, General ROBERT ALLEN, at Twelfth Annual Meeting, 5. 6  
President's Annual Address, 31.  
Remarks on Assuming the Chair at the Twelfth Annual Meeting, 7.  
Valedictory Remarks, 23.
- Blood, General R.A., Vote of thanks to, 25.
- Blood, General and Mrs., Receptions by, 63.  
Vote of thanks to, 24.
- Bloodgood, Surgeon D., Yellow Fever on the Jamestown, 213.
- BORDEN, Major W. C., Remarks in Acknowledgement of Vote of Thanks, 11.  
Remarks on a Public Service Medical School, 48, 55.  
Report of Incorporation Committee, 10
- Borden, Major W. C., Immediate Celiotomy in Gunshot Wounds, 287.  
Member of Auditing Committee, 8.  
Read paper at Twelfth Annual Meeting, 13.  
Vote of thanks to, 11.
- Boston Harbor, Excursion about, 66.  
Medical Library Association, Vote of thanks to, 25.  
Medical Library Building, 7.  
Meeting, Features of, 62.  
Old, Excursion about, 66.
- Briggs, Major Albert H., Elected Vice President, 21.  
Sketch of, 70.
- British Services. Decoration of Delegate from, 21.
- BRUSH, Brigadier General E. C., Remarks on a Public Service Medical School. 53-  
Buffalo, N. Y., Invitation to Meet at. 13.
- Bullet Wounds, Review of Smith on, 171.
- Bunker Hill Monument, 62.
- Burrell, General Herbert L., accompanied Surgeon General Mikulicz at Twelfth Annual Meeting, 16.
- CANAL, Resolutions on the Sanitation of the Isthmian, 11.  
Canteen in Denmark, 84.  
Carabanchel, Military Hospital of, 301
- Carrington, Surgeon Paul M., Presented paper at Twelfth Annual Meeting, 18.
- CARROLL, Lieutenant JAMES, History, Cause and Mode of Transmission of Yellow Fever and the Occurrence of Similar Types of Fatal Fevers in Places where Yellow Fever is Not Known to Have existed, 177.  
Presented paper at Twelfth Annual Meeting, 16.
- Carstens, J. H., Celiotomy in Gunshot Wounds, 278, 280.
- Castelli, Lieutenant Enrico, at Twelfth Annual Meeting, 5.  
Read paper at Twelfth Annual Meeting, 17.
- Cavalry Saddle Support for Wounded, 134
- Celiotomy, Immediate in Gunshot Wounds in War, 255.
- CHARLTON, Colonel WILLIAM J., at Twelfth Annual Meeting, 5.  
Remarks on a Public Service Medical School, 46.  
Decoration with Insignia of Association, 21.
- Cheyne, W. Watson, Celiotomy in Gunshot Wounds, 277.
- China, The Medical Department in, 92

- Church, Benjamin, Biography of, 321.  
Portrait of, 320.
- Circumcision and Flagellation among the  
Philippinos, 158.
- CLARKE, Major THOMAS C., Remarks on  
Place of 13th Annual Meeting, 21.  
Resolutions of acknowledgment, 23.
- Clarke, Thomas C. Member of Audit-  
ing Committee, 8.
- Club, Algonquin, Vote of thanks to, 25.  
Tavern, Vote of thanks to, 24.  
University, Vote of thanks to, 25.
- Committee, Arrangements, for Twelfth  
Annual Meeting, Acknowledgements  
to, 23.  
Auditing, on the Secretary's Accounts 8.  
Auditing, on the Treasurer's Accounts, 8  
Auditing, on Treasurer's Accounts, Re-  
port of, 18.  
Enno Sander Prize 1903, Report of, 11.  
Executive, Report of, 8.  
Incorporation. Report of, 10.  
Literary, Report by, 10.  
Necrology, Report by, 10.  
Nominating 1903, 15.  
Nominating, Report of, 21.  
Public Service Medical School, Report  
by, 10.  
Public Service Medical School, Report  
of, 37.  
Concord and Lexington, Excursion to, 64.  
Confederacy, Telegram from Association  
of Medical Officers of, 15.  
Telegram to Association of Medical  
Officers of, 16.  
Congress, Fourteenth International Med-  
ical at Madrid, 296.  
Contract Surgeon, 121.  
Cook, George, Member of Auditing Com-  
mittee, 8.  
Cook, P. A. Surgeon G. A., Yellow Fever  
on the Resaca, 215.  
Cordite Intoxication, 397.
- CRAIG, Lieutenant CHARLES F., The  
Pathology of Latent Malarial Infec-  
tion as Observed at Autopsy, 381.  
Craig, Lieutenant Charles F., Presented  
paper at Twelfth Annual Meeting, 17.  
Cuba, Yellow Fever at Las Animas Hos-  
pital, 225.
- D**AAË, Kaptein HANS, Medico-  
Military Innovations in the  
Swedish Army, 84.  
The Canteen in Denmark, 84.  
The First Aid Packet in Norway, 315.  
The New Uniform of the Danish  
Army, 396.
- DALTON, General SAMUEL, at Twelfth  
annual Meeting, 5.  
Danish Army Uniform, 396.  
Delegates and Associate Members, For-  
eign, Photograph of, 19.  
At Twelfth Annual Meeting, 5.  
Foreign, Decoration of, with Insignia,  
19.  
Denmark, Canteen in, 84.  
Dictionaries, Dorland's Medical, Review  
of, 410.  
Directory, New York Medical, Review  
of, 408.  
Dorland's Medical Dictionaries, Review  
of, 410.  
Douglas, Richard, Celiotomy in Gunshot  
Wounds, 276.  
Surgical Diseases of the Abdomen,  
Review of, 409.  
Dressing Stations on Warships, 389  
Drunkenness in the Philippines, 145.
- E**DITOR'S Report 1902-1903, 8.  
Edmands, Colonel Thomas F.,  
Vote of Thanks to, 24.  
Education of the Medical Of-  
ficer, 249.  
Eisendrath's Clinical Anatomy, Review  
of, 407.

- Elephantiasis, Case of, 210.
- Elliott, Mrs. Samuel, Vote of thanks to, 25
- Embryology, McMurrich's, Review of, 174
- Enno Sander Prize Announcement 1904, 319.
- Medal and the British Medical Services, 170.
- Report, 11.
- Epilation Among the Calingas, 305.
- Equipment, Medical, U.S. Army, 252.
- Of the Medical Department, 314.
- Medico-military, in China Expedition, Comparison of, 104.
- EVANS, Surgeon SHELDON G., Hysteria in the Male, 377.
- Presented paper at Twelfth Annual Meeting, 17.
- Ewing, Major Charles B., Read paper at Twelfth Annual Meeting, 17.
- F**IELD Service, Instruments for, 363
- First Aid in Naval Warfare, 395.
- First Aid Packet in Norway, 315
- Senn, 344.
- First Dressing on the Battle Field, 331.
- Fitzsimons, Medical Director P., presented paper at Twelfth Annual meeting, 13.
- FLAGG, Captain CHARLES EDWARD BELIN, A Further Consideration of the necessity for Immediate Celiotomy in Preventing Gunshot Wounds of the Abdomen in War, 255.
- Flagellation and Circumcision among the Philipinos, 158.
- Flint, Austin, Collected Works of, Review of, 408.
- Foreign Delegates and Associate Members, Photograph of, 19.
- Decoration of, with Insignia, 19.
- Forwood, W. H., Immediate Celiotomy in Gunshot Wounds, 285.
- FOSTER, Lieutenant Colonel C. C., Remarks on a Public Service Medical School, 52.
- Fowler, R. S., Immediate Celiotomy in Gunshot Wounds, 293.
- Fracture of the Metatarsus the Result of Marching, 133, 157.
- FRANCIS, Dr. GEORGE E., The Massachusetts Medical Society, 29.
- At Twelfth Annual Meeting, 5, 6.
- Vote of thanks to, 24.
- Frye, Colonel James B., Vote of thanks to, 24.
- G**ARSTANG, Reginald, Member of Auditing Committee, 8.
- Germs in the Philippines, 141.
- GIBSON, Lieutenant F. L., at Twelfth Annual Meeting, 6.
- Vote of thanks to, 23.
- Girard, Colonel Alfred C., presented paper at Twelfth Annual Meeting, 13.
- Gorgas, Colonel William C., Presented paper at Twelfth Annual meeting, 17.
- GORGAS, Colonel WILLIAM CRAWFORD, The Treatment of Yellow Fever at Las Animas Hospital, the Hospital of the Sanitary Department during the Epidemic of 1900 at Havana, Cuba, 225.
- Grant, Captain T. P., Read paper at Twelfth Annual Meeting, 18.
- Green, P. A. Surgeon F. V., Yellow Fever on the Lancaster, 218.
- GRIFFITH, Brigadier General JEFFERSON DAVIS, The Fourteenth International Medical Congress at Madrid, 12, 296.
- Gunshot Wounds of the Abdomen in War, 255.
- GUTHRIE, Surgeon JOSEPH ALFRED, Some Observations While in the Philippines, 141.

- H**ALL, J. N., Immediate Celiotomy in Gunshot Wounds, 271.
- Halsted, W. T., Celiotomy in Gunshot Wounds, 268.
- Harmon, Medical Inspector G. E. H., Presented paper at Twelfth Annual Meeting, 17.
- HATHAWAY, Lieutenant Colonel H. G., Ambulance for Wounded Troops, 134 Presented paper at Twelfth Annual Meeting, 17.
- Havana, Cuba, Yellow Fever at Las Animas Hospital, 225.
- HAYS, Contract Surgeon MELVILLE A., A Case of Elephantiasis, 210.
- Health of the Soldier, Preservation of, 369
- Heart, Non-fatal Spear Wound of the, 140
- HILL-CLIMO, Lieutenant Colonel WILLIAM, Preservation of Health of Soldier, 369.
- Presented paper at Twelfth Annual Meeting, 17.
- History and Description, Index of Medico-military, 316.
- Hoehling, Surgeon, Yellow Fever on the Monongahela, 217.
- HOFF, Lieutenant Colonel J. V. R., Report of the Public Service Medical School Committee, 10, 37.
- Presented paper at Twelfth Annual Meeting, 14.
- Holmes on the Surgery of the Head, Review of, 173
- Hospital. Field. 107.
- Military, of Carabanchel, 301.
- Ship, Best Type of, 244.
- Hotel Lenox, 63.
- Features of, 62.
- Vote of Thanks to, 25.
- Huntington, Surgeon E. O., Presented paper at Twelfth Annual Meeting, 17.
- Hygiene, Military Index of, 59, 167, 247, 399.
- Hysteria in the Male, 377.
- I**NSECTS in the Philippines, 145.
- Instruments for Field Service, 363.
- International Clinics, Review of, 175
- Medical Congress, Report of Delegate to, 12, 296.
- Intestines, Gunshot Wounds of the, in War, 255.
- Intoxication, Cordite, 397.
- Tuba, in the Philippines, 145.
- Isthmian Canal Resolutions, 12.
- IVES, Major FRANCIS J., The Medical Department in China, 92.
- J**ACKSON, Dr. Charles Ellsworth, Memoir of, 88.
- JARRETT, Major ARTHUR R. An Army Medical Reserve Corps, 330.
- JARVIS, Lieutenant Colonel NATHAN STURGES, The Necrology of the Association for 1902-1903, 10, 85.
- Remarks on a Public Service Medical School, 53.
- Jelks, General James Thomas, Memoir of, 88.
- JONES, Major G. C., Remarks on a Public Service Medical School, 55.
- Journal of the Royal Army Medical Corps, 115.
- JOURNAL, Report on, 1902-1903, 8.
- K**ALLOCH, Surgeon PARKER C., Quarantine as the Picket Line, 154.
- Presented paper at Twelfth Annual Meeting, 17.
- Kemp, Captain Franklin M., Memoir of 89
- KIRKPATRICK, Major W. O., Two New Litters from India, 245.
- L**A GARDE, Major LOUIS A., Poisoned Wounds by the Implements of Warfare, 116.
- Laundering in the Philippines, 148.

- LAWRENCE, Bishop WILLIAM, at Twelfth Annual Meeting, 5, 6.  
 Invocation, 26.  
 Vote of thanks to, 24.
- LeConte, Colonel R. G., Immediate Celiotomy in Gunshot Wounds, 290.
- Leech, A Land, in the Philippines, 144.
- Lexington and Concord, Excursion to, 64
- Library Association, Boston Medical.  
 Vote of thanks to, 25.
- Litter, Bed, for Tropical Service, 149.  
 Chair, 245.  
 Sling-Chair, 246.
- Litters in China Expedition, Comparison of, 106.
- Longfellow, Miss Alice, Vote of thanks to, 25.
- LUGO-VIÑA, Captain JOSÉ, Public Hygiene in Porto Rico, 150.
- M**CMURRICH'S Development of the Human Body, Review of, 174.
- McRae, F. W., Celiotomy in Gunshot Wounds, 272, 278, 279.
- Makins, G. H., Celiotomy in Gunshot Wounds, 275.
- Malarial Infection, Pathology of, 381.
- Marching, Fracture of the Metatarsus the Result of, 133, 157.
- Marcy, Colonel Henry O., Luncheon by, 63  
 Read paper at Twelfth Annual Meeting, 14.  
 Vote of thanks to, 24.
- Marks, Heine, Celiotomy in Gunshot Wounds, 270, 281.
- Marmion, Medical Director R. A., Presented paper at Twelfth Annual Meeting, 17.
- MASON, Major CHARLES FRANCIS, Notes from the Experience of a Medical Officer in the Tropics, 306.  
 Presented paper at Twelfth Annual Meeting, 17.
- Massachusetts Medical Society by President George E. Francis, 29.  
 The Commonwealth of, by Hon. John L. Bates, 27.
- MATTHEWS, Major VALENTINE, An Umbrella Shelter for the Wounded in Action, 112.
- Maybury, Colonel W. T., Presented paper at Twelfth Annual Meeting, 14.
- Medical Library Association, Boston.  
 Vote of thanks to, 25.
- Medicine, Military, Index of, 61, 167.
- Medico-military Administration, Index of, 59, 114, 166, 398.  
 Biography, Index of, 316.  
 History and description, Index of, 316.  
 Index, 59, 114, 166, 247, 316, 398.
- Meeting, Annual, for 1904, 405.  
 Invitations for Thirteenth Annual, 13.  
 Twelfth Annual, 1.  
 Social Features of, 62.
- Members of Association at Twelfth Annual Meeting, 1.
- Merrill, Mrs. Estelle Hatch, Vote of thanks to, 25.
- Metatarsus, Fracture of the, the Result of Marching, 133, 157.
- Mexico, Decoration of Delegate from, 20.
- Mikulicz, Surgeon General Johann, Remarks on Introduction to the Association, 16.
- Military Hygiene, Index of, 59, 167, 247, 317, 399.
- Military Medicine and Military Medical Officers, by Brigadier General Robert Allen Blood, 31.
- Military Medicine, Index of, 61, 167.
- Military Surgery, Index of, 60, 317.
- Morgan, John, Biography of, 401.  
 Portrait of, 400.
- Mudd, H. G., Celiotomy in Gunshot Wounds, 273, 278, 279.
- Murphy, J. B., Immediate Celiotomy in Gunshot Wounds, 278, 279,

Museum of Fine Arts, Vote of thanks to, 24  
 Myers, Lieutenant Colonel Charles F.W.,  
 Decease of, 254.

**N**ANCREDE, C. B., Immediate  
 Celiotomy in Gunshot Wounds,  
 282.

Naval Medical Officer at the  
 Battle of Cindad, Bolivia, 254.  
 Naval Service, Dressing Stations in, 389.  
 Warfare, Wounded in, 395.  
 Navy, Experiences of the United States,  
 with Yellow Fever, 211.

Necrology of the Association for 1902-  
 1903, 85.

New England Passenger Association,  
 Vote of thanks to, 25.

Women's Press Association, Vote of  
 thanks to, 25.

New York Medical Directory. Review of,  
 408.

Norway, Flrst Aid Packet in, 315.

**O**FFICER, A quasi, 121.  
 Officers and Ladies at the 12th  
 Annual Meeting, 65.  
 Officers of Association at 12th  
 Annual Meeting, 1.

O'Reilly, General Robert M. Elected 3d  
 Vice President, 21.

Sketch of, 71.

Organization, British Medico-military, 110  
 German Medico-military, 110.

Japanese Medico-military, 109.  
 of the Army Medical Department, 325.

**P**ALMER, Captain A. M., Vote of  
 thanks to, 24

Park, Roswell, Celiotomy in Gun-  
 shot Wounds, 274, 278, 279.

PARKER, P. A. Surgeon HERMAN B.,  
 The Etiology of Yellow Fever, 232.

Pathology of Latent Malarial Infection,  
 381.

Pensions, Service conditions in relation  
 to retirement and, 73.

Phelan, Captain Henry DuR., Presented  
 paper at Twelfth Annual Meeting, 14  
 Philippines, Medical Experiences in, 306.  
 Observations While in the, 141.

Photograph of Members at Twelfth An-  
 nual Meeting, 3.

Plymouth Rock, Excursion to, 66.

Poisoned Wounds by the Implements of  
 Warfare, 116.

Porto Rico, Medical Experiences in, 306.  
 Public Hygiene in, 150.

Powder, Injurious Effects of Gases Pro-  
 duced by Smokeless, 168.

PILCHER, Major JAMES EVELYN, Bed  
 Litter for Tropical Service, 153.

Cordite Intoxication, 397.

Decoration of Foreign Delegates with  
 Insignia of Association, 19.

*Journal of the Royal Army Medical  
 Corps*, 115.

Pistol Shot Wounds of the Chest and  
 Abdomen, 153.

Remarks on Report of Incorporation  
 Committee, 10.

Report of Executive Committee, 8.

Report of Secretary, 8.

Telegram to Association of Medical  
 Officers of the Confederacy, 16.

The Education of the Medical Officer,  
 249.

The Surgeon Generals of the U.S. Army  
 I. Benjamin Church, 321.

II. John Morgan, 401.

Pilcher, Major James Evelyn, Continued  
 as Secretary, 21.

Note upon Work of, 72.

Presented paper at Twelfth Annual  
 Meeting 14.

Secretary and Editor, Vote of thanks  
 to, 9, 25.

Pilcher, P. A. Surgeon Lewis Stephen,  
 Yellow Fever on the Saratoga, 216.

Pinkham, Lieutenant Edward W., Read  
 paper at Twelfth Annual Meeting, 18.

Pistol Shot Wounds of the Chest and  
 Abdomen, 153.

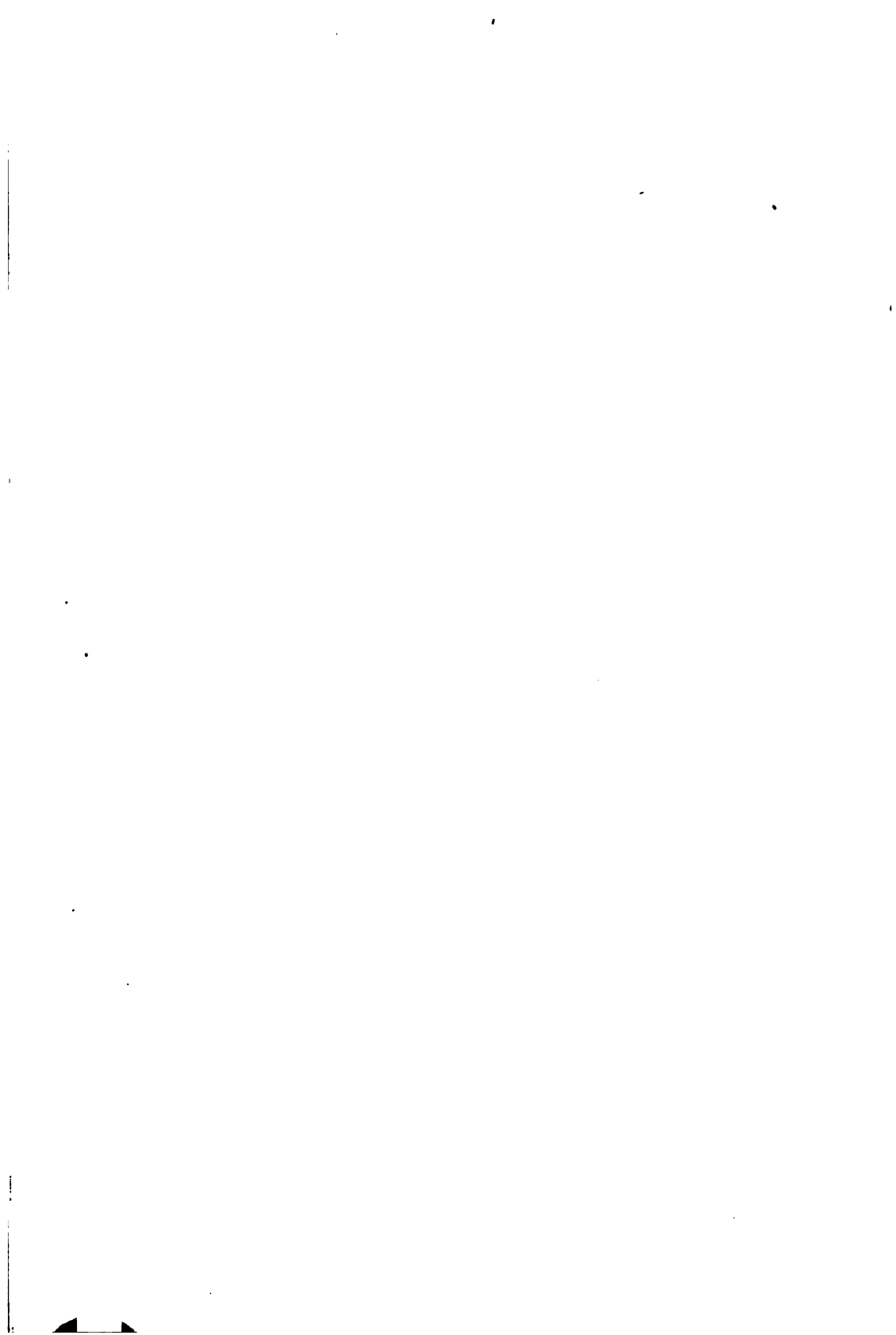
- Powder, Smokeless, Intoxication with, 397.  
 Practice, Review of Tyson's, 407.  
 Preservation of the Health of the Soldier, 369.  
 President's Annual Address 1903, 31.  
 Price, Mordecai, Celiotomy in Gunshot Wounds, 271.  
 Pryor, Surgeon J. C., Work at Battle of Ciudad Bolivar, 254.
- Q**UARANTINE as the Picket Line, 154.
- R**EDONDO, Don JUAN, Dressing Stations on War Ships, 389.  
 Reed, Major Walter, Memoir of 85.  
 Regimental Medical Officers, 371.  
 Reserve Corps, Army Medical, 330.  
 Resolutions of Acknowledgment, 1903, 23.  
 Retirement and Pensions, Service conditions in relation to, 73.  
 Reynolds, Captain Frederick P., Presented paper at Twelfth Annual Meeting, 11.  
 ROBERTS, DEERING J. Telegram from Association of Medical Officers of the Confederacy. 15.  
 Royal Army Medical Corps, Decoration of Delegate from, 21.  
 RUCKER, W. C., Winner of Second Place for Enno Sander Prize Medal, 11.  
 Russia, Decoration of Delegate from, 20.  
 RYERSON, Colonel G. STERLING, at Twelfth Annual Meeting, 5.  
 Remarks on a Public Service Medical School, 44.
- S**ADDLE Support for the Disabled, 134.  
 St. Louis, Mo., Invitation to Meet at, 13.  
 Meeting of 1904, 405.  
 Recommended as Place for 13th Annual Meeting, 21.
- San Francisco, Cal., Invitation to Meet at, 13.  
 Sanitation in the Tropics, 312.  
 School, Army Medical, 37, 249, 325.  
 Public Service Medical, 37.  
 Remarks on, by Major Azel Ames, 50.  
 Remarks on, by Surgeon H. G. Beyer, 44.  
 Remarks on, by Major W. C. Borden, 48, 55.  
 Remarks on, by Brigadier General E. C. Brush, 53.  
 Remarks on, by Colonel W. J. Charlton, 46.  
 Remarks on, by Lieutenant Colonel C. C. Foster, 52.  
 Remarks on, by Lieutenant Colonel N. S. Jarvis, 53.  
 Remarks on, by Major G. C. Jones, 55.  
 Remarks on, by Colonel G. Sterling Ryerson, 44.  
 Remarks on, by Medical Director F. B. Stephenson, 58.  
 Remarks on, by Lieutenant Colonel J. K. Weaver, 57.  
 Remarks on, by Medical Director John C. Wise, 47.  
 Remarks on, by Lieutenant Colonel R. R. Wreden, 43, 45.  
 Secretary's Report 1902-1903. Page 8.
- SENN, Colonel NICHOLAS, First Dressing on the Battle Field. 331.  
 Immediate Celiotomy in Gunshot Wounds, 283, 291.  
 Sexton, John C. Celiotomy in Gunshot Wounds, 272, 278, 279.  
 Shelter for Wounded in Action, Umbrella, 112.  
 Ship, Hospital, Best Type of, 244.  
 Skin Diseases in the Philippines, 142.  
 Skull, Subdural Hemorrhage without Fracture of, 162.
- SMITH, FREDERICK, Winner of Enno Sander Prize Medal, 11.



- Smith on Modern Bullet Wounds, Review of, 171.
- Soldier, Preservation of the Health of, 369.
- SPARREBERGER, Captain FREDERICK H., Epilation among the Calingas, 306.
- Sprague Hall, Medical Library Building, 9.
- STANDISH, Captain MYLES at Twelfth Annual Meeting, 5.
- Introductory Remarks at Opening Session, 26, 27, 28, 30.
- Vote of thanks to, 23.
- STERNBERG, General GEO. M., The Organization of the Medical Department, 325.
- STEPHENSON, Medical Inspector F. B., Remarks on a Public Service Medical School, 58.
- Stephenson, Medical Inspector F. B., Read paper at twelfth annual meeting, 14.
- Stevenson, Surgeon General W. F., Presented paper at twelfth annual meeting, 18.
- Subdural Hemorrhage without Fracture of the Skull, 162.
- Supplies, Medico-military, in China Expedition, Comparison of, 104, 107.
- Surgeon, Acting Assistant or Contract, 121.
- Surgeons, Regimental, 371.
- Surgeon Generals of the Army, Biographies of, 321, 401.
- Surgery, Military, Index of, 60, 317.
- Surgery of the Head, Review of Holmes on, 173.
- Surgery, Vaughan's, Review of, 406.
- Sutton, M., Celiotomy in Gunshot Wounds 277.
- Swedish Army, Medico-Military Innovations in, 84.
- T**AYLOR, Surgeon JAMES S., Note on the Injurious Effects of Gases Produced by Smokeless Powder, 168.
- Tavern Club musicale, 65.
- Teeth, Care of the, in the Philippines, 148.
- Thesaurus, A Medical, Review of, 176.
- Thompson, Sir William, Immediate Celiotomy in Gunshot Wounds, 293.
- Transportation in China Expedition, Comparison of 105.
- of Wounded, 358.
- Tropics, Notes from Experiences of a Medical Officer in the, 306.
- Tuba Drinking in the Philippines, 145.
- Typhoid, Anti-, Inoculations, 79.
- Tyson's Practice, Review of, 407.
- U**MBRELLA Shelter for the Wounded in Action, 112.
- Uniform of the Danish Army, 396.
- Upham, Mrs. Lulu S., Vote of Thanks to, 24.
- V**ANSANT, Surgeon JOHN, Memoir of, 90.
- Vander Veer, A., Celiotomy in Gunshot Wounds, 272, 278, 279.
- Vaughan, Major George Tully, Celiotomy in Gunshot Wounds, 273.
- Member of Auditing Committee, 8.
- Read paper at twelfth annual meeting, 18.
- Vaughan's Surgery, Review of, 406.
- W**EAVER, Lieutenant Colonel JOSEPH K., Remarks on a Public Service Medical School, 57.
- Report of Nominating Committee, 21.
- Resolutions on the Sanitation of the Isthmian Canal, 11.
- WIEBER, Surgeon FRANCIS W. F., Report of a Case of Subdural Hemorrhage without Fracture of the Skull, 162.

- WIEBER, Surgeon FRANCIS W. F., Son of the Experiences of the United States Navy with Yellow Fever aboard Ships, 211.  
Presented paper at the twelfth annual meeting, 18.
- WILSON, EZRA H., Anti-typhoid Inoculations, 79.
- WISE, Medical Director JOHN CROPPER, Inaugural Remarks, 21.  
Remarks on a Public Service Medical School, 47.  
Service Conditions in relation to Retirement and Pensions, 73.
- Wise, Medical Director John Cropper. Biographical Sketch of, 67.  
Elected President, 21.  
Member of Auditing Committee, 8.  
Read paper at twelfth annual meeting, 14.
- Woods, Medical Director George Worth, Memoir of, 91.
- Woolsey, George, Celiotomy in Gunshot Wounds, 277.
- Wounded in Action, Umbrella Shelter for, 112.  
In Naval Warfare, 395.
- Wounds, Modern Bullet, Review of Smith on 171.  
Pistol Shot, of the Chest and Abdomen, 153.  
Poisoned, by the Implements of Warfare, 116.  
Spear, of the Heart, 140.
- WREDEN, Lieutenant Colonel ROMAN R., Acknowledgement of Decoration by, 20.  
At Twelfth Annual Meeting, 5.  
Remarks on a Public Service Medical School, 43, 45.  
Decoration of, with Insignia of Association, 19.
- Wyeth, J. A., Immediate Celiotomy in Gunshot Wounds, 284.
- Wyman, Surgeon General Walter, Elected 1st Vice President, 21.  
Sketch of, 70.
- Y**ELLOW FEVER aboard Ships, 211.  
At Las Animas Hospital, 225.  
Causes of, 205.  
Etiology of, 232.  
History of, 177.  
Transmission of, 208.









41c 1129+